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[OFFICIAL NOTICE.]

Wrinkle Department, Western Gas Association.

WESTERN GAS ASSOCIATION, OFFICE OF SECRETARY, NEW ALBANY, IND., February 5th, 1897.

All members of the Western Gas Association who contemplate contributions to the "Wrinkle Department" should forward them, before March 20th, to its Editor, Mr. George Treadway Thompson, No. 40 Wall street, New York city.

It is hoped that many will avail themselves of the opportunity to assist in keeping this most interesting and instructing department up to its usual standard.

Members will please act promptly and forward "Wrinkles" without further solicitation. JAMES W. DUNBAR, Secretary.

TWENTY-SEVENTH ANNUAL MEETING, NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

The New England Association had little to complain of on the occasion of the celebration of its Twenty-seventh birthday, for in the month most notorious for uncertain weather conditions, the latter were all that one could wish. As New Englanders are proverbial for their dislike of exceeding verbiage, it is enough at the outset to say that weather, house quarters and numbers of delegates were in quality and degree sufficient to cause the Association to know that it is well in the field with even the youngest of its contemporaries; for, in everything appertaining to quality or degree, the portents of its 1897 assemblage had not been exceeded. The studious appearing President of the Mother Association, Mr. Charles D. Lamson, of Worcester, Mass., with that confidence born of prior occupation, experienced no difficulty nor manifested any hesitation when, in the "second floor parlor" of Young's, he announced that the Association was ready to make its 27th record, which announcement was uttered shortly after 10 of the morning of last Wednesday. Within the range of his voice, and responsive to the drop of his gavel, were assembled the New England's members and guests—all representatives of an industry, whose survival of the wreck (to them heralded by the blatant blast of Mr. Edison in 1878) of their trade seems to be very well attested by the attention paid to it just now by legislators in general, by legislatures in particular, and by owners of electric light plants in anyway. Aside from speculation and reminiscence. our duty is to report the meeting as it was, and to that task attention is hereafter solely given. Perhaps, though, it would be as well to say, before confining ourselves to routine, that between the night of arriving and the morning of meeting, the recent gas exhibition in New York came in for much discussion, and a fair verdict over the expressions heard would be that it was a success, save in respect of the Tiffany gas tower, which it is hoped will be sent to Paris—and kept there. Now, for the routine.

The report of the Board of Directors was mainly notable for the fact that it recommended the naming of 12 additional members—10 active and 2 associate—after which a special committee (Col. F. S. Richardson

and Mr. H. B. Leach) saw to it that the Association's guests were properly attended to. The roll call showed the presence of 86 members, and the visitors numbered at least 25. In due time President Lamson delivered his inaugural message, which paper bristled with facts, set out in the Worcester man's piquant way. Much of the paper related to the Whitney invasion last year of the Massachusetts gas field, and goodly attention was also paid to the 10 or more bills so far presented to the consideration of the Massachusetts Legislature for the harassment of Bay State gas interests. In short, President Lamson gave a matter-of-fact statement that, despite its length, will receive close attention, when in due time it appears in print, from many a gas man whose business circle is outside of New England. It is a pity that some lines of the off-hand discussion which followed the reading of the address cannot be reproduced; for they certainly would be read with interest by Mr. Burdett Loomis and his associates, who are now attempting to Whitneyize Connecticut. However, Mr. Loomis and his friends will comprehend the effect of the discussion later on. The next business in hand was reports from memorial committees in respect of deceased members. This mournful duty, in the instance of the Association's late Honorary Member (Mr. Joseph Russell Thomas) had been committed to the tender care of a trio of his associates (Messrs. A. B. Slater, F. C. Sherman and H. B. Leach), and their tribute was as the Association would have it—honest and sincere. Another fraternal act was the minute to the memory of the late Mr. Gideon Wood, of New Bedford, Mass., compiled in graceful form, by Messrs. N. W. Gifford and Robert B. Taber. The report of the Nominating Committee, to name office bearers for the ensuing year—which report, of course, was adopted—showed that the men to dominate affairs in 1897-8 would be:

President—Mr. Samuel J. Fowler, Springfield, Mass.
First Vice-President—Mr. Walter R. Addicks, Boston, Mass.
Second Vice-President—Mr. Waldo A. Learned, Newton, Mass.
Secretary and Treasurer—Mr. Chas. F. Prichard, Lynn, Mass.
Directors—Messrs. N. W. Gifford, C. J. R. Humphreys, F. S. Richardson, H. A. Atwood and A. J. Purinton.

A feature following the election was the clever introduction by Capt. White of President-elect Fowler to the Association, and Mr. Fowler's response in acknowledgment of his elevation. Routine business having been well and consecutively transacted, the Association took up the technical programme. In this respect the Association had more in store than it knew, for although the JOURNAL's list of a week ago named but six papers, that enumeration was far short of the reality, since the ultimate number read was nine. The first paper read was that by Mr. Carl H. Graf, of Lawrence, Mass., who wrote on "The Extraction of Ammonia from Spent Oxides." The paper was short, concise and reasonable, and while it did not evoke much discussion it is likely to cause "chemical" gas engineers to think it over again in their quiet moments. The paper on "Gas Distribution," by Mr. W. H. Snow, of Holyoke, Mass., was then read and discussed, which matters ended the morning session. The proceedings of the afternoon session were started by the reading of the paper, by Mr. W. E. McKay, of Boston, on "Temperature," which title, variable though it is, gives but a poor idea of the range with which the author dealt. Next came the report of the Committee on President's Address, and then the paper by Mr. S. J. Fowler, of Springfield, Mass., entitled, "Some Remarks on Coke Ovens and their Products." Although a large subject, the author treated it succinctly, and that his hearers comprehended him was shown by the brisk discussion that followed. A fraternal telegram, from the Michigan Gas Association in fourth annual session at Ann Arbor, Mich., was read. Secretary Prichard was instructed to make suitable reply to the message from the Wolverine territory, and the first day's sessions terminated. In the evening the annual dinner was brought off with that satisfaction inseparable from an encounter of the sort at "Young's." Mr. McKay acted as toastmaster, and in his direction of that office he showed himself quite up to the taking of the social temperature of those over whom he ruled. Over four score assisted in the festivities, and the speech of the evening was made by Mr. Forrest E. Barker.

The second day's assembling was marked by fine weather and a splendid attendance. The routine proceedings were in this order: The paper by Col. Frank S. Richardson, of North Adams, Mass., on "Separate Meters and Special Prices for Gas Stove Consumption," which led to a snappy discussion. Then followed a neat presentation of the subject of the "Measurement of Gas," by Prof. C. W. Hinman, of Boston, who certainly may be considered a past master on that matter.

Mr. Walter R. Addicks, of Boston, seemingly not a bit the bigger because of his appointment to the Chief Engineership of all the "Bay State Companies," and his elevation to the position of First Vice-President of the New England Association, next told the members about some "Reports of Gas Leaks: The Method Adopted by a Large Gas Company," and told his story well. Mr. C. D. Jenkins, the State Gas Inspector, followed with an excellent paper on "Calorimetry;" after which that Eastern gas Nestor, Mr. H. F. Coggeshall, of Fitchburg, made "A Comparison of Gas Making in '53, with Gas Making in '96, with Some of the Writer's Experiences," which was well worth listening to. One or two questions of general interest were then discussed, and, after the usual votes of thanks, the New England's 27th meeting was declared adjourned. In every sense it was a satisfactory and valuable assembly.

FOURTH ANNUAL MEETING, MICHIGAN GAS ASSOCIATION.

The Fourth Annual Meeting of the Michigan Gas Association was held in the Cook House, Ann Arbor, Michigan, on the 17th and 18th days of the current month. The Association had fairly good luck in the matter of weather, and its founders should have much reason for satisfaction over the fact that 26 out of 39 Companies in the State are represented by membership in the Association. Another living reason for their belief that the Association is to go on to greater things is found in the knowledge that 15 new members were elected—9 active, 5 associate and 1 honorary. President Eaton's address was a practical document, devoted largely to a presentation of statistics, showing the relative importance of the gas business of Michigan to the other industries of that rapidly growing State, and to a declaration that if the gas industry would work harmoniously, legislation harmful to its development might be retarded, if not arrested.

A paper was read by Mr. L. M. Latta, of Goshen, Ind., on "One Way of Placing Gas Stoves and Welsbach Lights." And Mr. H. B. Walbridge, of Grand Rapids, Mich., reported some "Notes" that we will repeat later on. Many useful "topics" for offhand discussion were well threshed, and it is regrettable that the Association's rules debar us from reporting the dialogues. Another paper, by Mr. L. E. Walker, of Lansing, Mich., dealt with "Snags" successfully removed. This paper we hope also to print in due time. The election for officers resulted as follows:

President—H. W. Douglas, Ann Arbor, Mich.
Vice-President—C. H. Raynor, Adrian, Mich.
Secretary and Treasurer—Henry H. Hyde, Saginaw, Mich.

The Association named Port Huron as the next place of meeting. A feature of the proceedings was the sending of a telegram of goodwill and best wishes for a successful meeting of the New England Association, then in session at Young's Hotel, Boston. In due time an acknowledging telegram, in Secretary Prichard's best style, was received. On the afternoon of Thursday the Association and its guests, by special car, journeyed to the University of Michigan, the noble work of which splendidly equipped and well maintained institution has made it famous over the world. The visitors inspected the chemical laboratory, the mechanical section, the library and the art gallery, and were more than pleased over their examination of these divisions of the University's huge establishment. Professor Stanley, Director of the musical section of the University, entertained the guests with several selections on the huge Columbian organ—said to be the largest organ in this country—opening the harmony treat with the overture from "Poet and Peasant," and ending it with a splendid recital of Mendelssohn's "Wedding March." The party on returning visited the Ann Arbor gas works. Those who remained over Thursday night were royally entertained by Mr. Douglas, the entertainment consisting of a well put on "beefsteak supper," covers for which were laid in the pretty dining room of "The Town and Gown Club." The supper was an informal one, and was thoroughly enjoyed by the guests and their genial host. The meeting was an excellent one, and proves beyond doubt that the Michigan Association has a mission to perform, and that it is quite up to doing so successfully.

NOTES.—The Depew and Lancaster Power and Conduit Company, to supply gas and electricity in the towns of Depew, Lancaster and Cheektowaga, Erie county, N. Y., has been chartered by Messrs. John N. Scatcherd, W. B. Rogers, Martin Cary and others, of Buffalo. It is capitalized in $20,000.——At the annual meeting of the Waltham (Mass.) Gas Company the officers chosen were: Directors, L. Clark, John R. Farnum, A. T. Lyman, A. M. Goodale, G. A. Stearns, Augustus Flagg, William Roberts and F. A. Foster; Clerk and Treasurer, G. A. Stearns.

PROCEEDINGS THIRTEENTH ANNUAL MEETING, OHIO GAS LIGHT ASSOCIATION.

HELD AT MADISON SQUARE GARDEN, NEW YORK, FEB. 3 AND 4, 1897.

FIRST DAY, FEB. 3.—MORNING SESSION.

The Association was called to order at 10.30 A.M. of Feb. 3, by the President, Mr. Jerome Penn, of Washington C. H., Ohio.

WELCOMING THE ASSOCIATION.

President Penn introduced Mr. E. C. Brown, Managing Director of the Gas Industries Company, who addressed the Association as follows:

Gentlemen: On behalf of the Gas Industries Company, it is my privilege to offer you a hearty welcome to the city of New York on the occasion of your Thirteenth Annual Meeting. I had expected that Prof. Chandler, the President of the Gas Industries Company, would be here this morning to welcome you, and also some of the other officers of our Company; but in their absence I extend to you a most hearty welcome to New York during your meeting. I assure you that everything that the officers and the management of the Gas Industries Exposition can do for you will be done, and all you have to do is to let us know your wants. (Applause.)

On motion of Mr. Cline the minutes of the last meeting were not read.

The President then called for the

REPORT OF THE EXECUTIVE COMMITTEE,

which was read by Secretary Lathrop:

To the Members of the Ohio Gas Light Association: The Executive Committee makes the following report:

1. That Messrs. Printz, Prichard and Coombs be appointed as a Nominating Committee.

2. That Messrs. G. H. Rumsey, E. H. Hamlin, James B. Smallwood, David Buel, William S. Essick, G. W. Boudinot, J. W. Alexander, M. D. Evers, Jr., and H. H. Kelly be released from membership at their own request.

3. That Messrs. Beman G. Dawes, F. W. Little, Frederick Wells, A. L. Gassett, A. L. Woolen, W. A. Luce, W. L. Wells and A. B. Eaton be elected to active membership.

4. That Messrs. Joseph Gwynn, C. H. Welch and J. W. R. Cline be appointed as an Advisory Committee for a period of four years.

5. That Messrs. J. D. McIlhenny, E. S. Templeton and J. F. Seamon be appointed a Committee on Memorials.

JEROME PENN,
J. GWYNN,
GEO. WHYSALL,
B. P. HOLMES,
} Committee.

On motion of Mr. Butterworth the report was adopted. The

ANNUAL REPORT OF THE SECRETARY AND TREASURER

was then submitted by Mr. Lathrop. From the statement it was shown that the rolls hold 174 active and 12 honorary members, and that 7 badges were on hand. The financial statement showed a total receipt for the year of $939.56, a total expenditure of $660.89, and a balance of $278.67.

The reports, which had been approved by the Finance Committee, were accepted and placed on file. The President asked if the Advisory Committee was ready to report, to which Mr. Gwynn replied that the Committee would present its report when the Association went into executive session.

ROLL CALL.

The roll call disclosed the presence of the following members:

Honorary Members.

Harbison, J. P., Hartford, Conn.
Barker, F. E., Worcester, Mass.
Ramsdell, G. G., Philadelphia, Pa.
Brown, E. C., New York City.

Active Members.

Bonney, W. P., Erie, Pa.
Bowen, W. S., Philadelphia, Pa.
Boyle, W. C., Salem, O.
Butterworth, I., Columbus, O.
Byers, C. A., Haverford, Pa.
Callender, E. P., New York City.
Christian, G. H., Norwalk, O.
Cline, J. W. R., Springfield, O.
Collins, D. J., Philadelphia, Pa.
Connelly, J. S., Titusville, Pa.
Coombs, M., Youngstown, O.
Cressler, A. D., Fort Wayne, Ind.
Dell, J., St. Louis, Mo.
Dickey, C. H., Baltimore, Md.
Doherty, H. L., Madison, Wis.
Douglas, H.W., Ann Arbor, Mich.
Evans, C. H., Chicago, Ills.
Faben, C. R., Jr., Toledo, O.
Floyd, H. E., New York City.
Franklin, J., Norwood, O.
Gregory, J. M., Bellefontaine, O.
Gribbel, W. S., New York City.
Guldlin, O. N., Fort Wayne, Ind.
Gwynn, J. W. Bucyrus, O.
Gwynn, J., Steubenville, O.
Harper, H. D., Chicago, Ill's.
Harris, G. S., Mansfield, O.
Hayward, S. F., New York City.
Hedges, W. C., Mansfield, O.
Henderson, E. H., Pittsburgh, Pa.
Higgins, C. M., New York City.
Holmes, B. P., Youngstown, O.
Hoyt, E. S., Detroit, Mich.
Jones, T. C., Delaware, O.
Kelly, H. H., Hamilton, O.
Lathrop, A. P., Columbus, O.
Lloyd, E. F., Fort Wayne, Ind.
McCook, G.W., Steubenville, O.
McDonald, D., Albany, N.Y.
McDonald, W., Albany, N.Y.
McIlhenny, J., Philadelphia, Pa.
McIlhenny, J. D., Phila., Pa.
Mansur, J. H., Royersford, Pa.
Maxon, J. H., Gallipolis, O.
Miller, A. S., L. I. City, N.Y.
Mills, J., Marietta, O.
Osius, G., Detroit, Mich.
Penn, J., Washington C. H., O.
Persons, F. R., Toledo, O.
Philipp, E. B., Findlay, O.
Prichard, W. W., Portsmouth, O.
Printz, E., Zanesville, O.
Roots, D. T., Connersville, Ind.
Roper, G. D., Rockford, Ills.
Russell, D. R., St. Louis, Mo.
Seamon, J. F., Uniontown, Pa.
Shelton, F. H., Chicago, Ills.
Stacey, F. A., Chillicothe, O.
Stacey, J. E., Cincinnati, O.
Stephens, J. G., Pittsburgh, Pa.
Stevenson, J. B., 3d, Van Wert, O.
Tayler, G. H., Warren, O.
Templeton, E. S., Greenville, Pa.
Van Wie, E. G., Detroit, Mich.
Warmington, D. R., Cleveland, O.
Whysall, G., Dayton, O.
Wilke, F. A., Richmond, Ind.
Wilkiemeyer, H., Evansville, Ind.

The following visitors were also in attendance: A. L. Chester, Westerly, R. I.; George B. Neal, Charlestown, Mass.; Edmund Cathels, Hamilton, Ont.; Earle H. Buck, Vincennes, Ind.; John J. Nix, Royersford, Pa.; Z. T. F. Runner, Freeport, Ills.; George H. Harper, Altoona, Pa.; C. H. Raynor, Adrian, Mich.; A. B. Slater, Providence, R. I.; T. Littlehales, Syracuse, N. Y.; I. C. Baxter, Detroit, Mich.; B. F. Chollar, St. Louis, Mo.; Frederick Egner, Norfolk, Va.; S. J. Glass, Milwaukee, Wis.; W. M. Eaton, Jackson, Mich.; C. H. Nettleton, Derby, Conn.; George T. Thompson, New York City; R. B. Taber, Boston, Mass.; H. H. Wells.

President Penn said he hoped the visitors would make themselves thoroughly at home, for the Association enjoyed their presence and hoped their voices would be heard in the discussions.

The President then read the following

ANNUAL ADDRESS.

(For the President's Address, see JOURNAL, Feb. 15, p. 238.)

The Secretary—Gentlemen, you have heard the President's address, what is your pleasure?

Mr. Butterworth—I move that the Secretary appoint a committee to consider the suggestions and recommendations contained in the President's address and make a report thereon at a future session of this meeting. (Carried.)

The Secretary—I will appoint on that committee W. C. Boyle, H. W. Douglas and D. R. Warmington.

WELCOMING THE GUESTS.

The President—As we have among our visitors this morning quite a number of eminent gas men, I am sure the members of the Ohio Association will be very glad to hear from them. Among them is Mr. A. B. Slater of Providence. We shall be glad to hear from him.

Mr. Slater—I am very much pleased to be with you here to-day. In looking around the room I see many familiar faces, and also many new faces. My friend Sherman and myself, something over 60 years ago, started in this business, and we have been keeping it up ever since. My friend Harbison is also here, and he will give you more by way of instruction than I can.

The President—We would like to hear from Brother Harbison.

Mr. Harbison—Mr. President and fellow members of the Ohio Association, for I have the honor of being a member: The President has already extended a greeting to the gentlemen who have honored the Association with there presence here, and who are not upon the roll of membership. We congratulate ourselves on being able to hold the lucky number—the thirteenth—anniversary of our Association in this town, 110 miles from the capital of the country, from which Providence, New Haven and other villages get their gas inspiration. Occasionally it gets up as far as Boston and in that neighborhood, and Brother Neal comes amongst us. We look forward, Mr. President, to an especially interesting meeting at this time, because these visiting brethren have come in expecting to occupy as nearly one-half the hours allotted to the meeting as you will permit them to do. Our friend from Syracuse, who has recently come over the line from a foreign country and settled among us, has always been full of good things, and he wants an opportunity, if you will listen to him for about an hour and a-half, to enlighten us poor fellows of the Ohio Association as to how he can make gas of better quality, sell it at lower rates, and get larger dividends and larger income for the managers, than anybody else in the fraternity. He will tell you all about it—if you will give him an hour and a-half. I am told that there is quite an interesting exhibition in this building, and as the President has well said in his address, I hope that the members of our Association and visiting friends will take time enough to see that exposition, outside of the hours allotted to this Association. Business first and pleasure afterwards—that is the gas man's motto, and so let it be with this meeting. Let the gentlemen who

have prepared papers for our consideration receive the attention which they deserve, and I am sure that this meeting cannot fail to be a success. I thank you for the opportunity which you have given me to add my voice to the welcome already extended to our visiting friends.

The President—We shall be glad to hear from Mr. Littlehales.

Mr. Littlehales—Mr. President and Gentlemen: I appreciate the welcome which you have extended, and I assure you that I appreciate the opportunity of meeting so many gas men here. It is my pleasure as well as my privilege to meet with you, and I am glad to see here the faces of so many that I know. I thank you for your cordial welcome.

The President—We would like to hear from Mr. Neal, of Charlestown.

Mr. Neal—Mr. President and Gentlemen: As they say in religious meetings, "I am happy to be here." I have taken a little cold on the way. I came on with my friends from Boston, and although I was in another car with my daughter a part of the time, most of the time I was with them, andwe had a very pleasant time coming on, although it was not so *quiet* as it might have been. I am glad to see so many of my friends here. I believe that I am one of the oldest gas men here, although of course Sherman and Slater, and those fellows, are very much older than I am—not in years, but in experience. I do not know that I dare say a word in their presence. We have with us also Mr. Barker, of the Gas Commission of Massachusetts, who keeps us under his thumb, but who is a very good fellow nevertheless. Being so young, I am not accustomed to the ways of New York; and as I took a bad cold in coming here, my voice is not very effective. I assure you I am delighted to be here. I have many times wished that I could attend a meeting of the Ohio Gas Light Association, but never before have had that privilege; but now that you have come here near us, we are very happy to meet you and to welcome you. I started from Boston for New York at 12 o'clock, and at 5:40 I was in the New York station. That is a pretty quick passage, so that really New York is very near to us in Boston. It is somewhat larger than Boston, but it is not much larger than a little village I passed through as I came on—Hartford—which is a very quiet and unassuming sort of place; if I had the time I would have been glad to get out and walk around, and to go through its forests and beautiful summer gardens. I hope you will have a very successful meeting. I am glad that you came here. I was in favor of having the meeting of the New England Association in New York, but the Executive Committee decided otherwise. I am very glad to see you all here. You have grown up since my recollection. Many of you I do not recognize, but most of you I have seen in the years past. I notice that your ideas crop out so that they do not leave much hair on the top of your heads; but you are growing older and are getting more experience every day. We are reducing the price of gas, and are making some money; and although the Company that I represent is engaged in the business of electric lighting as well as gas lighting (and we make water gas), still we are doing a very good business—as far as the gas part of it is concerned. I cannot say so much for the electric light business; but still we are thankful to get what we have. There is quite an agitation in Boston, at the City Hall where the cranks meet daily, on this subject of water gas; but we do not care for that—we are ready to meet them.

The President—We would like to hear from Mr. Barker.

Mr. F. E. Barker—Mr. President and Gentlemen of the Association: I hardly think I need any introduction to this meeting, although our friend from Charlestown undertook to give me one. I am sorry that I alarmed him so by coming in as I did. If I had known he was on his feet I would have waited until he had finished his speech, because I would not wish to embarrass him. I am very glad indeed to be present at this meeting. I have not thought I should be able to meet with the Ohio Association this year, but as they have come so far East I determined to make the effort to meet again with those whom I have seen so many times, and whom I am so glad to meet on all occasions. I do not wish to take up your time, for I know that your sessions will be fully occupied, and I know that you will be interested in what has been presented for you to see here. Indeed, I know that you are always interested and busy whenever you come to New York; and so I recognize the fact that I ought not to take up much of your time. I wish to say that I am very glad to be here and am sorry I was not here at the opening of the session, but hope to have the pleasure of meeting and greeting you again individually.

The President—We have another honorary member of our Association—Mr. Ramsdell—whom we would like to hear from.

Mr. Ramsdell—I am very glad indeed to be present at this meeting. Usually the meetings of the Ohio Association are held at a time of the year when it is very difficult for me to get away, and I was therefore particularly pleased when I learned the Association had decided to have its meeting in New York at this time. I was just on the point of getting on my feet to make a motion, and I think that after thanking the Association for this opportunity of speaking to them, I will proceed to make that motion. I think that one of the peculiar features of our Associations is the bond of fellowship that springs up among us as the result of meeting year by year in such conventions as this. We learn to regard each other in such a way that we rejoice in the prosperity of any of our members, and we mourn with them in their troubles. I have learned this morning, since coming into the building, that one of the members of this Association, whom we all know and whom we all regard very highly, has received distressing news; and I have thought that it was no more than right that this Association should express to him its sympathy at this time. I refer to Mr. George D. Roper, who, as I understand, received news from his home this morning that his father was dead. I think it would be appropriate, and I make the motion, that the Association tender its sympathies to Mr. Roper in his afflictions. (Carried.)

The President—We have one or two friends from the West whom we would like to hear from. I see that Mr. Baxter, of Detroit, is here.

Mr. Baxter—I must say, Mr. President, and members of the Association, that I am very much pleased to meet with you for the first time. I do not want to take up any of your valuable time by making one of my long-winded speeches. I will leave that to some of the other speakers whom I see around me.

The President—We have another representative from the West—Mr. Chollar, of St. Louis.

Mr. Chollar—I understand that part of the morning hour has been placed at the disposal of distinguished gas men and of members of the Ohio Association, and since I have not the honor to belong to either class, I beg to ask Mr. Harbison, who has the honor of belonging to both, to continue his speech—which he made unusually brief this morning, and to give us a little more light.

Mr. Harbison—I think you have heard enough from me for the present.

The President—No doubt there are a number of others here whom I have not called on, but from whom we would be pleased to hear if they feel like giving us a few words of encouragement. We shall all be glad to hear from Mr. Sherman.

Mr. Sherman—I thank you most cordially for this invitation, and I should be glad to respond in fitting terms if I were able to do so; but I am not very much given to speech making, and always take my friend Harbison around with me to make the speeches. I am very glad to meet with you, and I am sure that we shall go away from here wiser and better for having had this opportunity to meet one another, and to confer with regard to our work. I thank you for your kindness in giving me an opportunity to meet with you; and I shall be pleased to see any of the members of the Association in my place, and to have them stop when passing through there.

The President—We shall be glad to hear from any others who are here.

Mr. McDonald—Of the gentlemen who have spoken, with the exception of Mr. Brown, I think none are New York people; and so I get on my feet because I am a New Yorker. I have been disappointed in the last two years in not being able to attend the meetings of the Ohio Association, because they were held in Ohio—a long distance away; but I feel thankful that this year the Ohio Association has come to New York to hold its meeting. I wish to add a word of welcome to that which has been expressed by Mr. Brown. I welcome the members of the Association to the city of New York, and I assure you that we New Yorkers will do all that we can to make your visit pleasant and profitable.

The President—Next in order will be the reading of the paper, by Mr. T. C. Jones, of Delaware, O., on

GAS STOVES—THEIR INTRODUCTION, CONSTRUCTION AND USE.

(For Mr. Jones' paper, see JOURNAL, Feb. 15, p. 239.)

Discussion.

The President—We have heard an excellent paper, and we would like to have it thoroughly discussed. There are quite a number of ideas in it which are new to many of us. I know that Mr. Printz has had a good deal of experience with gas stoves, and we would like to hear from him.

Mr. Printz—I agree with you, Mr. President, that Mr. Jones has read us a very able paper; and he has covered almost all of the points. I agree with some things he has said, and with others I do not. As to the introduction of gas stoves, and the methods he has used in introducing

them, I may say that I think we have tried most of them ourselves; but there is one which is quite new to me, and I think a good deal of it. That is by addressing personal letters to gas consumers and to others who are not using gas. I think that is a very good feature. I do not quite understand why his gas stoves should be so short lived, unless he has selected, or was unfortunate enough to purchase, very poor stoves. We have had no trouble of that kind. We have stoves which have been in use for at least 10 years. I have one sheet iron stove that I have just taken out of my own home within the last three weeks, which has been in use for about 8 years. I took it out for the purpose of putting in a larger stove, but the old stove is apparently as good now as it was the day it was put into use. I do not quite agree with him in his statement that they make better stoves in England than they do in America. I think we have just as good stoves here as can be purchased anywhere. My experience with English stoves has not been very satisfactory. We have only had about half a dozen of them, and one of them was brought over by a relative of our friend McMillin, and was brought to our town as *the* stove; but it proved to be a very poor one; it consumed a great deal of gas—much more than our American stoves—and it was necessary to keep the doors and windows open while using the stove in order to allow the odors to escape. For that reason I am not very much impressed with the value of the English gas stove, or in fact of any foreign made stove; I think we can get just as good stoves at home. If people wish to buy a high priced stove they can get a cast iron stove which will last a lifetime. I am satisfied that our steel ranges are just as good as can be made anywhere else, and if they are half taken care of they will last for many years.

The President—Are there any others here who can give us information on this subject?

Mr. Doherty—I do not like to have this subject go by without more discussion. I noticed several things in Mr. Jones' paper to which I would like to refer, and one of the important ones is his reference to the use of personal letters in advancing the gas business. I think that plan ought to be tried by everyone. I understood Mr. Jones to say that he has been very successful in that line. I think a personal letter is better than a circular, because it always appeals to one more directly, and the recipient feels obliged to give such a letter some consideration. If it is not out of place, I would like to inquire of him what stove it was that lasted only four years. That has not been my experience with gas stoves. I think they ought to last much longer—at least 10 years. I know that some will go very quickly, especially if they are not used in the winter time, and are allowed to rust. There is no question but that the introduction of poor stoves will have a bad effect upon the gas business. We had some experience of that kind some time ago. We had a stove shipped to us which had lots of nickel plating on it, and was very pretty in appearance. I was not at home at the time, but our people sold it, and the result was quite a large gas bill the first month—so large in fact that the stove was ordered out. Then it was sold to a second hand dealer, and he sold it to another consumer, and this consumer in the first month of its use had to pay for 13,000 feet of gas at $1.25 per 1,000 cubic feet. I told our people that they had better give him a stove—a good stove—than allow him to use that. I know nothing about the English stove which has been referred to, but I think that the desire of the purchasing agents of companies to buy cheap stoves has prevented our manufacturers from making good stoves, and has kept good stoves from coming into more general use. The only thing these agents talk about or consider is the selling of a stove at a low price; its efficiency is quite lost sight of. They do not make a satisfactory test to ascertain how efficient the stoves are. The parties are anxious to sell, and if the stove happens to give satisfaction in use, all right. And yet you can go to the houses of people who claim that their gas bills are higher than those of other people who are using gas stoves, and in many instances we can ascertain that this is due to better or more efficient stoves being used.

Mr. Roper—I would like to say something on this question, speaking from the manufacturer's point of view. I have had an English stove and a French stove both on exhibition at our place. I have had both of them in use, with a meter on them, and I know exactly what they will do. I have roasted 10 pounds of beef in an oven which was brought over by an Englishman and represented to me as the latest and best stove manufactured. The French stove was brought over last fall. That has a coke burner besides, but that feature I cannot make work and would like to present it to some fellow who can. I roasted 10 pounds of beef in the English stove, and had a meter attached to the stove so that it registered exactly the gas consumed, and ascertained that it required 85 feet of gas to roast it to perfection. It is enameled all the way through. It is quite a delicately built stove, but otherwise it is all right. My wife said when I brought it in that I had better lock the door for fear the burglars might come in and take it away. Now, any American built stove to-day that will consume 85 feet of gas in roasting 10 pounds of beef ought to be thrown into the river. I do not believe there is one in use that will require over 25 feet, and 35 feet of gas would be extravagant. The products of combustion come into the stove. They make a great deal of talk about this, because the oven cock is on one side and the burner below. There is no bottom to the oven, and the drip pan rests on the floor. It has an arrangement of a by-pass so that when the door is closed you open a cock and turn the gas on fully, and if you slam the door top, you will not blow the gas out in the oven; but it will light back, and it will take 15 minutes before you can get it running. It is enameled, and it is in a nice shape, and if taken care of it will stay there; but if you give it the use that is generally given to American stoves in six months you would not know that it had been enameled. So far as to American stoves not being made as well as the English stoves, you may go downstairs and go around among the different exhibits, and you will hear people ask which is the cheapest stove. A man will say, "I want to buy a stove for $8," and will compare that with a $40 English stove. As far as the gas going into the oven is concerned—that is no hurt at all; it is all bosh, prejudice, and nothing else. That is one thing that the American manufacturers have failed to convince people about, but since we have a few English stoves coming here they see that it is eminently proper to have the combustion going on in the oven. If you will pay us $40 for a stove I will guarantee it to last for 50 years.

Mr. Whysall—My experience with gas stoves has been with natural gas wholly. It is my opinion that the majority of stoves have too much gingerbread work on them; they have too many traps and triggers to get out of order. With our gas the more efficient the stove, the greater and more rapid is the deterioration. The plates appear to oxidize very rapidly, and, when the stove is out of use for a short time, become damp, the scale then falling down in large pieces. In the course of time the plates are eaten through.

Mr. Maxon—I would like to inquire how the introducers of gas stoves overcome the competition of gasoline stoves. Our greatest difficulty in introducing stoves is in the fact that the hardware dealers have induced people to purchase gasoline stoves. Some of our consumers who have invested $25 or $30 in gasoline ranges would buy gas ranges if they could get rid of their gasoline ranges. I would like to ask Mr. Jones, or any other member, if there is any scheme by which we can do away with the gasoline ranges. I think that in many towns, if gasoline stoves could be gotten out of the way, lots of gas stoves would be put in their places.

Mr. Doherty—I will tell the Association of a scheme I have in mind, but which I have not yet put in operation. Last summer I subscribed to a clipping bureau and asked for clippings on accidents caused by the use of gasoline. I have also found out every gasoline stove in town. Periodically, say once a week, I mail the users a zinc etching of a newspaper clipping detailing some horrible accident from the use of gasoline stoves. I have a collection of about two dozen of these clippings, but was afraid to use them all for fear the hardware men would come back on me. If I cannot send them any other way, I send a solicitor to find out where gasoline stoves are used, and have him sit down and read those clippings to the users of such stoves. I do not think there will be any trouble in driving gasoline stoves out of use in that way. I have read all the clippings, and I know they are calculated to cure any man who has an idea of the safety of the gasoline stove.

Mr. Littlehales—I think one point raised by gentlemen here in respect to gasoline stoves can be overcome in this way. Get one of the hardware dealers in the town to buy a gas stove of some kind. If the hardware dealer is not interested in getting a profit out of the gas company he will sell a gasoline stove every time; but if you have some arrangement with with your local dealers to the effect that if they sell a gas stove they will get some profit out of it, then, in nine cases out of ten, they will sell a gas stove in preference to a gasoline stove. I have found that to work very well during the past year. We have an arrangement under which, when any dealer sells a gas stove, he gets a commission on it from the gas company. I believe in that way scores of gas stoves are sold by hardware dealers in place of gasoline stoves. I offer that as a suggestion which I think will be found practicable and effective.

Mr. Roper—Let me tell you the scheme adopted by one man who has been remarkably successful in selling gas stoves—90 per cent. of his gas consumers are using ranges. He hands to the editor of his newspaper $25, and tells him that whenever he finds an account of an acci-

dent resulting from the use of a gasoline stove to insert the item in his paper as an advertisement, and when the $25 is gone to let him know and he can have more. He says it does not take very long to use up the $25, for he keeps such an account in as an advertisement right along.

Mr. Whysall—Another way of taking care of gasoline stoves appears to work very well. We have special burners which can be fitted on the gasoline stoves. We simply take the gasoline burner off and substitute a gas burner, and thereby save the consumer the expense of a new stove.

Mr. Doherty—I would like to ask Mr. Whysall if, when he gets through with that alteration, the stove has not cost about as much as a new gas stove would cost; and if it can be compared at all with a gas stove. We tried that scheme at Columbus, Ohio, and we never thought very much of it, because it cost us about $4 to make the change on a 3-burner stove. You can buy a 3-burner gas stove for about $2.

Mr. Whysall—The point to be considered is this: Your customer has already invested his money in a gasoline stove, and before he makes any change he would like to get his money back, in the way of service from his gasoline stove, and we think it much better to have the consumer spend $3 or $4 in that way rather than lose him, and the consumer then thinks he has something which is all right.

The President—I do not agree with Mr. Doherty's remarks about gasoline stoves. I found we could make the change in that way and replace the gasoline stove by a gas stove, and it is advantageous to do away with the gasoline stove in that way. I think the scheme of advertising accidents resulting from the use of gasoline stoves is a good one. I have taken pains to cut out all the accounts of such accidents, and have had them put in the papers and have found it a great help.

Mr. Jones—I did not intend to say that in technical and mechanical details the English gas stoves were in advance of ours. The stove I have in my own kitchen was made in this country, but the principles involved in the construction of the stove are English. I know that in stoves we are in advance of the English, just as we are in everything else, but this stove is certainly very complete and very efficient. In a practical way I find it saves about 30 per cent. of the gas—that is to say the oven does. I do not think it is on account of any peculiar burner, but just on account of the direct radiation in the oven.

Mr. Roper—Is the stove which Mr. Jones has in his house one of the large gas ranges, with a large oven—an exact duplicate of the English range?

Mr. Jones—Yes; but it has a single oven. It is of cast iron, is enameled inside, and has a movable bottom.

Mr. Roper—You say that you save 30 per cent?

Mr. Jones—Yes.

Mr. Roper—Does it have an arrangement, so that when the gas is turned on full the damper is open wide, and when you close down the gas you shut off the damper?

Mr. Jones—You regulate the damper by hand. It is not automatic.

Mr. Roper—The ranges on exhibition down stairs work automatically. If you can tell me how you can take a current of air through the stove with the bottom open, and heat a space four times as large as you are required to use, and do it with 30 per cent. less gas, I would like to see the test made. You are carrying a current of air through your oven, are heating the air from the floor, and carrying that out of the flue, and unless you are using the flue to the best advantage you are simply using it as a heating stove.

Mr. Jones—The stove has a bottom which is put on a slide below. The air space amounts to only 2 or 3 inches.

Mr. Roper—You can put it on any slide?

Mr. Jones—This is for the bottom. The slide can be adjusted to make the oven larger or smaller.

Mr. Roper—If it takes 85 feet of gas to roast 10 pounds of beef, when 25 or 30 feet with the American stove is sufficient, it is extravagant. Do you have a meter on it?

Mr. Jones—Yes. I believe the design is preferable to a double oven, where the broiler is so low and inconvenient that it is seldom used. I also think the enamel lining is kept clean more easily than the bare iron.

On motion of Mr. Holmes, the thanks of the Association were voted to Mr. Jones for his paper.

A Dip into the Question Box.

The President—We will next take up the 7th question from the Question Box:

"What is the best furnace for annealing sheet zinc and copper?" Mr. Boyle can probably say something on that question.

Mr. Boyle—I hardly want to open the discussion, as I asked the question and am in the dark myself about it. We have a factory at Salem, where a great deal of annealing of zinc and copper is done. It is at the works of H. H. Mullins, of Salem, who made the copper statue of Diana, which graces the tower of Madison Square Garden. They put in one or two furnaces of different construction, which do not seem to work exactly right. If I had a furnace which would give satisfactory results I have no doubt they would put in seven or eight double furnaces, each of which furnaces would burn from 3,000 to 5,000 feet per day, meaning quite an increase of business for the gas company. That is the reason I have asked this question.

Mr. Gwynn—Will Mr. Boyle explain what the trouble is?

Mr. Boyle—Our trouble is two-fold. 1. We have not been able to get a burner which will give perfect combustion; and (2), we have failed to secure a proper device for quickly opening and closing the furnace when a blank is to be removed. Blanks or plates are put in the oven, and as the stamp mill is right beside the oven—they have to open the door to take out a blank and put it in the press—on opening that door the heat comes out. They tried to put in drawers, but those did not operate very satisfactorily. Now, we want to fix some kind of drop door, operated by the foot, so that it will fly back quickly and save the heat. They put in each furnace a dozen or two blanks, and take out one at a time, put it in the stamp mill, and then are ready for the next one; and they want to give them a uniform heat. These are blank sheets of copper and zinc. I did not know but that some of the members in manufacturing towns were making or using such furnaces and could direct me to the manufacturers.

Mr. Whysall—I would like to ask the size of these sheets.

Mr. Boyle—They vary. Some are 5 feet long and 3 or 4 feet wide.

Mr. Whysall—I have had no experience in handling zinc and not very much with copper, but it occurs to me that a furnace similar to those in iron mills for heating sheet iron would answer. As to the combustion, my idea is you would not want what is commonly called good combustion in a furnace of that kind, because then you would oxidize your sheets. You would not want a sharp flame; on the contrary, you would prefer a long, slow-burning flame.

Mr. Boyle—Would you get the necessary heat from that flame?

Mr. Whysall—By confining it you would.

Mr. Boyle—We tried confining it, but did not get the necessary combustion.

Mr. Whysall—I think if you examine some of the furnaces in sheet iron mills in your vicinity you will find a method which would answer and be economical.

The President—I would like to impress upon the minds of our visitors that we are very anxious to have them take free part in these discussions. Do not be backward. Perhaps you know something that we do not, and if so we want to find out all we can. We do not want you to think that because you are visitors you have no rights here. If there is no other business we might take a recess now. We want to get through our work as soon as possible, so as to give the members who are here an opportunity of seeing the Exhibition. Our first duty, however, of course, is to attend to the work of the Association, and so I hope that you will be prompt in coming in at the beginning of the sessions.

Mr. Neal—As a guest I would like to know who are present outside of the Association, and I do not know that any means of ascertaining that have been taken. I think a very good way would be, for those who are present other than members of the Association, to leave their cards with the Secretary, or if they have not a business card with them, to write their names on the list.

The President—I am very glad Mr. Neal has made that suggestion, and I wish that, as soon as the adjournment is taken, our visitors would hand in their cards or write their names on the list. We want to know you, and hope to meet you again. We shall certainly be pleased to have you come to Ohio and meet with us there. Owing to special request, we will now listen to the paper, by Mr. G. H. Christian, of Norwalk, Ohio, on

STATE REGULATION OF CORPORATIONS.

(For Mr. Christian's paper, see Journal, Feb. 15, p. 241.)

Discussion.

The President—We would like to have this paper fully discussed. Cannot Mr. Gwynn give us, from the experience which he has had, some light upon the subject?

Mr. Gwynn—While I agree with a great many things stated by Mr. Christian in his paper, yet I think it is pretty hard to have such a statute enacted as would regulate corporations and fix matters in the shape he desires. It is true there is a great deal of political scheming

going on in local municipalities, and a great many people are elected to office as Councilmen and Aldermen, for the purpose of furthering their own political ends; the same thing is experienced in legislatures. You take a body of legislators, and they are supposed to go to the legislature for the express purpose of enacting laws, but when they are elected the first thing they figure out is how they can further their own interests. If they are members of the House they probably have an ambition to be made Senators at the next election; and the first thing they do is to attack a corporation so as to show their constituents that they have been working hard to further their interests, and knowing that they will further their own political ends in that way. It has been found that in the Ohio Legislature a great many members who, wanting to go to Congress, will introduce a bill against some corporation in the vicinity of their own home, and will push that bill simply for capital (not because it would be beneficial to the public at large), and to get notoriety. When you seek to amend the laws and elect people for that purpose, you will find just as much corruption in the legislatures as in your municipal bodies. The fact of the matter is, it is pretty hard to regulate it, and local conditions in many respects act disadvantageously. I think this is a matter that must be handled by parties in the vicinity in which the trouble arises, and not in a general way. Commissioner Barker has, of course, had more experience in this direction than any of us, and as he can probably suggest ideas which might be beneficial to some of us, we would be pleased to hear from him.

Mr. Barker—I have naturally been very much interested in this paper, but have had no opportunity to give it any particular thought before coming here, nor even to see the paper except while Mr. Christian was reading it. While I have given some thought, of course, to the general propositions involved, so that I am very glad indeed to take note of the things which appear in it, my familiarity with the subject and its difficulties leads me to hesitate about discussing it. I notice one proposition, which I believe is a thoroughly good one, on the 6th page, where he says that "all corporate property and business is a benefit to a community in proportion to its ability to earn a fair margin of profit at the least cost to the consumer." I think that is a very important proposition, and, with possibly a minor qualification, strictly true. I think I have said elsewhere that a poor and crippled public service corporation is a misfortune to a community oftentimes rather than a benefit, and that those companies are of the most real service to the public that are able to earn, as the writer says, with the least cost to the consumer, a fair profit, and to properly use that profit. Those conditions I think contribute largely to a satisfactory service, and tend to promote the most agreeable relations between the public and the corporation. Of course, if you are to have State supervision, just what it should be and just how it should be administered are questions which must be determined by the peculiar local conditions. I have been very much struck with the importance of this fact as my attention has been called to methods which have been employed not only in this country, but on the other side of the Atlantic; and I think that intelligent public opinion is disposed to regard the effort to reach the peculiar difficulties surrounding these corporations by statutes merely as inadequate. If it is sought to so frame statutes that they will meet specific abuses, they are likely to be either so rigorous as to hinder progress and the exercise of that keen business ability which is so valuable in corporations of this kind, or they will necessarily be so vague and loose as to invite in another form those very abuses which cause so much complaint. I have an impression that wherever it has been tried the most successful administration has been where the statutes have been liberal, and in one way or another have vested a considerable responsibility in the individuals who are charged with their administration. Those individuals require, of course, for the most successful administration, something more than the general adaptation which every man interested in public affairs may have. If large concerns, which come so close to the people as those in which you are interested, are to be dealt with at all, they should be dealt with by men who thoroughly understand them; by men who, while they have the public interest at heart, yet are inclined to believe in corporate enterprises rather than to oppose them; who recognize the advantages which come through that way of doing business, and the fact that that is the only way in which the business can be done, is done, or ever has been done successfully by private capital. This combination we sometimes think does not exist in every man who has to do with public affairs. As I have said, I am not prepared to discuss this paper at this time, and I do not know that I am prepared to make any suggestions which will be of value; but I am very much interested in it, and very glad to hear the subject discussed.

Mr. Ramsdell—I have also been very much impressed with this paper, and I think that Mr. Christian's idea is, not that this shall be put into immediate action, but that it shall be used more as an outline of an aim to work towards. I have always been in favor of Gas Commissions for States; and it has seemed to me there is no other State in the Union where one is needed so badly as in the State of Ohio. They have a law there which I think is exceedingly unjust to corporations, and to the gas companies in particular, by which the City Council or the municipal authorities have the right to fix the price of gas in local communities. I had an experience in Ohio, and I am sure if I could have appeared before a Gas Commission I could have satisfied them, and we would have had no trouble. We had to deal, however, with the City Council, and I will give them the credit of trying to do what was fair. They admitted that our price was not too high, and was not more than we ought to have; but at the same time they also admitted, indirectly, that there had been so much clamor raised on the part of the press and the general public that, for political reasons, it would not do for them to make that kind of a report. The consequence was our price was reduced. It was an unjust act, and the men who reduced it knew that it was unjust; but, owing to this political pressure, they did not feel free to act. Now, if Ohio had a State Gas Commission such a case as that would be submitted to fair arbitration, and there would be no such injustice done as political clamor demanded. I think one very shrewd point suggested in this paper is that such an arbitration could be effected without the publicity which comes from the press. We are all familiar with the attacks of the press, and we know just how they come about, and how difficult they are to suppress. For that reason I have always thought that Ohio was peculiarly a State needing a Gas Commission.

Mr. Barker—Will you allow me to suggest one thing more? An idea which has been suggested by the last speaker, and which I had in mind but forgot to mention, is called to my attention by the statement on the seventh page of this paper, where reference is made to hearings before the Board of which I have the honor to be a member, as "private hearings." That is perhaps a mistaken impression. All the hearings which are given before our Board upon any matters of public interest are public hearings. I do not see how a public board can deal otherwise with the questions which come before it, and in which the public are interested. Of course there are many examinations made by the Board, and very much information comes to the Board from companies which is necessarily confidential and must be so regarded. The relations between the companies and the Board could not possibly be such as would secure the best possible results in its administration if it were otherwise. But the hearings are public hearings. And our observation with respect to the attitude of the press, under the conditions which surround public hearings, is that while the press may be very violent in its tone with respect to the matter under consideration while the hearings are in progress, I have never known a case, when the hearings were finished and the subject matter was decided, where any issue has been taken with the Board by the press. These hearings go on publicly; they receive more or less attention in the press as they proceed, and when the Board makes its decision it gives its reasons to the press. The newspapers are always ready, and more than ready, to publish them; and those reasons always appeal to the business intelligence of the community, which is thoroughly understood and respected by the press. When those reasons commend themselves to the sturdy business sentiment of the community, they are not apt to be maligned by the press; you may be quite sure of that.

Mr. Faben—As these comments in respect to legislative and municipal bodies in the State of Ohio are made in the presence of a great many members and friends who are not conversant with the laws of that State, I think a word ought to be said in its defense. Generally speaking, the present Constitution of Ohio recognizes two general grand classes of business. In granting franchises to corporations they recognize one as being a business that can be duplicated cheaply, and as, therefore, being governed by the law of competition, it needs no other law; the other class is a business that can be enlarged very profitably, and, therefore, not being governed by the laws of competition, must be controlled by law. Now, in the absence of having these specific laws to govern in each case, they delegate to the town council, or to the city council, as the case may be, upon a charter being granted for a particular place, the right to fix and regulate the price that they may charge from time to time for their product—the only qualification being that that price must be a fair and reasonable price. The price being unfair or unreasonable, or becoming so in the course of things, it does not raise a question which you can bring into court as to its unfairness or unreasonableness, because the court has no jurisdiction in those cases. It only comes into court when a charge of fraud is made, and

on an allegation that these people have attempted to rob you of your property by exercising the power that they have. Another phase that the paper does not just clear is in respect to the matter of duplicating companies. Under the laws of Ohio, wherever there is a company in operation, before another company can go into operation in that same field—the town council alone cannot grant that right—the statute says that, until after a vote has been taken by the people, they cannot get an ordinance, thus indicating that the people must first express their wish; then, finally, an ordinance is passed by the council ratifying the action of the people. The statute does not say what shall constitute a vote, but there is a statute which says that wherever the statutes are silent as to what shall constitute a vote, it shall mean a majority of the qualified voters voting at that election. It does not mean that if only three people vote on the question, and one votes "No" and two vote "Aye," it shall be carried; but more than half the people voting at an election must say "Aye" before the town council can grant a right to any company to operate in that field. Then, if a new company comes there and offers gas, or any other product, and has nothing better to offer than simply the matter of price, that is not considered a good argument, because the matter of the regulation of price is vested in the town council to begin with. If I had a fuller knowledge of the law, such as our friend and fellow member Commissioner Barker has, I would like to elaborate it a little more; but from what I have said I think you can see the main point. I merely offer these suggestions as a defence for Ohio, for the State has certainly been maligned somewhat this morning.

Mr. Printz—I think Mr. Faben did not make one point quite clear. If the parties favoring the franchise succeed in having the election that he speaks of as a special election, if there are three votes for it and two against it, it is carried; but, if it comes before the people at a general election, then it must have a majority of all the votes cast at that election on that particular question.

Mr. Faben—The statute says that the question must be passed upon at a general election. It cannot be at a special election.

Mr. Printz—Then they must have amended the law, because it was not so at one time when the matter came up.

A Member—The law was amended in 1884 or 1885.

Mr. Faben—Do you know of any special election ever being called to determine that question.

Mr. Printz—It was done right in our city of Zanesville.

Mr. Faben—When? Was it very recently?

Mr. Printz—No; it was about the time of the craze for the Fahnehjelm burner—about ten years ago.

Mr. Holmes—Notwithstanding the benefits which have been stated in favor of the laws of Ohio, the gas companies, being quasi-public corporations, have resting upon them great responsibilities in protecting their interests. It seems that almost every legislature finds it convenient to take an interest in these quasi-public corporations. It happened during the last session of the Ohio Legislature that bills were presented which required the combined efforts of interested parties to prevent their becoming laws. Some of these bills I am sure would have wiped out all the profits of the existing lighting companies, and possibly affected some others. It seems to me that this question should be put upon a business basis as between all the parties interested. The present method of meeting these attacks is not one that commends itself to our admiration. Unable to fight them openly, you have to reach them in some indirect way that carries with it certain potent influences; and the general public whom we are working for does not appreciate the conditions under which we have to work. There is not a quasi-public corporation that has valuable business interests to protect but finds that some of its revenues are necessarily diverted in this direction; and if their ability to direct them properly in case of attack is not pertinent, grief is sure to follow. It seems to me that a Commission is certainly desirable, where all questions could come up on their merits and be determined by those who are competent to judge of the conditions. Take our councils. We have those who have not the least acquaintance with the subject in hand trying to regulate our business; but it is a popular move, and the companies are required to meet it. They cannot do this openly. They claim that we are making more money than we should—and there may be conditions under which we do not care to spread our business before the general public; but if there is a Commission acting for the State and municipalities, which understands its business, the parties interested could meet there and settle their differences with much better results.

Mr. Faben—The matters which come before a legislature are almost always questions of taxation—how to raise the revenue; and every gas company in Ohio is familiar with the fact that the legislature cannot enact a law which shall apply to gas companies *only* on matters of taxation. They must tax every kind of corporation that enjoys a privilege akin to the one that gas companies enjoy. The law governing this question must be general and not specific in its character, and cannot apply to any one particular industry.

Mr. Butterworth—I would like to say a word in connection with the suggestion which Mr. Christian makes in the last paragraph of his paper in commenting upon the desirability of State Gas Commissions. I suppose that the question of having a State Gas Commission in Ohio on the principle suggested is proper and should be carried out; but, for the benefit of those who may be ignorant of the fact, or who may have forgotten it, I might mention, as a matter of history, that a few years ago a systematic and strenuous effort was made in Ohio to establish there a State Gas Commission patterned largely after the one in existence in Massachusetts. The best legal talent in our State was engaged in the matter, but the scheme failed, largely through the indifference, and, I might almost say, the opposition of the prominent gas companies in the State, without whose efforts we could hardly hope to succeed. When a gas company gets into trouble it wants a commission, but the rest of the companies then have ordinances fixed up very nearly to their satisfaction, and they are indifferent. If we could all get together and pull together we could have a commission.

Mr Gwynn—The same opposition now exists that Mr. Butterworth alludes to.

On motion of Mr. McIlhenny the thanks of the Association were voted to Mr. Christian for his paper.

The Association then took a recess until 2 P. M.

FIRST DAY—AFTERNOON SESSION.

The President—The first paper this afternoon will be that by Mr. Ernest F. Lloyd, of Fort Wayne, Ind., entitled

THE LARGE GAS ENGINE: ITS PRESENT DEVELOPMENT AND FORECAST OF ITS FUTURE.

[For Mr. Lloyd's paper, see JOURNAL, Feb. 15, p. 242.]

Discussion.

The President—Mr. Lloyd has certainly given us a very interesting paper. I hope it will be thoroughly discussed, and all the points that bear upon the subject brought out. Will Mr. Whysall start the discussion?

Mr. Whysall—In Dayton, where they are supplying natural gas, we have between 85 and 90 engines in operation. In Springfield we have in the neighborhood of 50. I cannot give you the number of concerns building engines in either town, but I think we have about 12 or 15 in the two towns. They are all building strictly first-class gas engines which are guaranteed to give a very uniform speed. Having so many manufacturers we have very little, if anything, to do with the engines other than to furnish the service and set the meter. As a rule the engines give satisfaction, but where isolated electric plants are being operated with them the current is apparently very irregular, notwithstanding the claims of the manufacturer to the contrary. We have at Springfield an engine of the Otto type, built in that city, of 100 horse power, which has been in operation now for about 1½ years. I am unable to say whether the engine is working up to this rate or not, but at 25 cents per 1,000 cubic feet they have paid us as high as $37 per month. You can readily see from that where we would land with manufactured gas at ordinary rates. Being very much interested in the subject, we are quite anxious to have a better engine, if such a thing is possible. Personally I look forward to an engine which will admit of direct connection to the dynamo. I think it is our only way out. Where we have to instal a gas engine on the countershafting plan, with flywheels in some cases, and a lot of belts to look after, much trouble is occasioned, and does not do our business any good.

Mr. McCook—How does the price of natural gas compare with the price of coal in Dayton?

Mr. Whysall—As an instance in illustration. A concern, paying between $250 and $300 per year for coal, paid us last year $48, for gas at 25 cents per 1,000 cubic feet, for running a gas engine, and saved the wages of a stoker.

Mr. Doherty—On page 6 Mr. Lloyd says, "And, third, maintaining a constant speed upon the engine by its own governor, and applicable to any class of work." That is what I thought they all tried to do—maintain the same speed.

Mr. Lloyd—Yes, they try to do it, but the difficulty is to do it. The point is to maintain a constant speed upon the engine by its own governor, and applicable to any class of work.

Mr. Doherty—From the way that read I took it the experiment consisted of three parts, and that the third experiment was in maintaining a constant speed upon the engine by its own governor, and applicable to any class of work.

Mr. Lloyd—That "applicable to any class of work" means it will maintain a steady speed upon the engine irrespective of the load upon the engine, and independent of whether it is fluctuating or steady. In order to accomplish it the governor regulating the admission of charges is made extraordinarily sensitive to variations in speed. In other words, it is done by electrical contacts, which are so much more sensitive than mechanical means that it is impossible to make a comparison between them, but on the slightest change in speed the indication is made, and the engine takes the explosion. Any ordinary mechanical governor is so slow, owing, as I stated further back, to the difficulties in the way of overcoming the friction, and through losses in the governor itself, that it will permit the engine to take one or two explosions more than required when the load goes off, and subsequently, when it comes on, the governor will not respond quickly enough to give the engine gas just when it needs it.

Mr. Doherty—Then, if I understand you, by using this governor, by electrical contact you can maintain, with a steady load, an absolute speed on the engine?

Mr. Lloyd—With a steady load we can maintain an absolutely steady rate of speed. With a varying load, as shown by the card—which is very poor, because the reduction was so great, varying from nothing up to about 143-horse power, in five seconds of time, the extreme variation of engines is within 1½ per cent. drop from its normal number of turns. It will recover itself before the end of the minute. Therefore, I say that the speed indicator will maintain the normal number of turns minute after minute, and with scarcely a variation, while the tachometer will show that the speed is varying slightly, but not exceeding 3 per cent. of the total during that time.

Mr. Doherty—Is the engine at Lancaster, O., fitted with this electrical governor?

Mr. Lloyd—Yes.

Mr. Egner—I was under the impression that the discussion related not only to *large* gas engines, but to gas engines generally. I am sorry I had not an opportunity to look over the list of papers to be read before the Association before I came here, for then I would have brought some interesting data with me in respect to the application of gas engines to street railway service. I can only give you a few notes which I think are well worth remembering. Two roads are now in operation in Germany—one at Odessa; where it was found that the cost of constructing a gas railroad is about one-quarter less than an electrical railroad, and the cost of maintaining the system is about one half that of an electrical road. Those are facts well worth remembering. The cars differ in appearance very slightly, or hardly at all, from the cars on electric roads. They run as fast; there is no difference in speed, and, as I have just stated, the cost of maintaining the system is only about one half that of a system where electric motors are used. I think that is a fact worth remembering by gas men generally. Some two years ago they built an electric road at Norfolk, Va., and I tried to get the owner of it to consider the gas engine; but the thing had already gone too far when I heard of it. In this country we had no gas engine for street railway work, excepting the Connelly engine, and that, it seems, is not a success. Those which they have in Germany, and have operated for some years, are of a different type; and it would be well worth while for manufacturers and street railway owners to look this matter up.

Mr. Lloyd—I would like to say to Mr. Egner that this paper has reference to driving electrical generators for operating street railways, and I believe his remarks were with reference to engines operating cars individually.

Mr. Egner—Yes; for operating cars individually.

Mr. Lloyd—I wish to sharply define the distinction.

Mr. Egner—I thought it might be well to mention the matter since we were speaking of gas engines.

Mr. Templeton—I recollect seeing a gas engine at work (in Pittsburgh, in the Hamilton Building), which was located under the sidewalk, in a space 20 by 10 feet—in that space was the 50-horse power engine, the belt and the dynamo. It was employed to run about 300 electric incandescent lights in the building, and also to run the elevator at the same time. Watching the indicator—it was in the middle of the day, and about half of the lights were on—I found that when the elevator was not running the amperage was 50, but when the elevator started it would jump to 300, and then fall back to 110. The voltage was but 110, and apparently it did not vary over 1 or 1½ volts. They claimed 1 volt, but it may have been a little over that.

Mr. Egner—Did that have a storage battery?

Mr. Templeton—No; it was a double engine. I do not know whether it was of the same kind that has been spoken of here, but I do know it was an unusual make. It was a double engine—had two slides to it, so that either one or both could run.

Mr. Doherty—Unfortunately, I am in the electric business as well as in the gas business, and we have street railway work to contend with, which has caused me to look up the variations due to service of that kind. If they did not get a variation of more than 1 or 1½ volts I can only explain it by the fact that they had the storage batteries connected up in parallel, or else the voltmeter was out of order.

Mr. Whysall—If the generator was over-compounded in the proper ratio, it would make up for the decrease in speed. Then you could decrease the speed proportionately without decreasing your voltage. If you maintained your speed your voltage would increase 10 per cent.

Mr. Doherty—Do you say that it can be done?

Mr. Whysall—It is done.

Mr. Doherty—With a gas engine?

Mr. Whysall—With any engine. In the first place, you must have your generator over-compounded so that it will build up as the load increases. In one of our stations we are operating a generator which is over-compounded 10 per cent., and it does build up as the load increases. It is driven by a single-valve engine, which decreases materially in speed as the load sendout in amperes increases.

Mr. Doherty—I do not know what kind of an engine you have there, but I do not think it possible for a gas engine to respond so quickly. Mr. Miller may know something about it.

Mr. Miller—I am afraid I do not know half as much about it as Mr. Doherty seems to think; but if an engine is large enough to give 300 amperes load, with a constant voltage, it must be very much too large for his work. His plant was built for 160 amperes and 110 volts, and it was big enough to run 300 amperes without any reduction in voltage. In other words, the plant was made twice as large as necessary, just to meet that instantaneous increase. I should think it would work very much better, when installing a plant of that kind, to make some arrangement by putting two machines on and using one engine, as they might be able to keep the speed of the engine all right, but they cannot keep the pull on the dynamo uniform unless it is made enormously large. In connection with the suggestion of Mr. Whysall, as to direct connection machines, I will say that I do not see any reason why they cannot be directly connected; and if they govern as closely as the steam engine there is no particular reason why they cannot be directly connected. The only difference in variation of speed between those directly connected and those connected by shafting would be the assistance which the inertia of the shafting would lend, and the inertia which could be put into the flywheel. I think Mr. Lloyd has taken advantage of the steam engine when he refers to 80 pounds, and one-fifth cut-off. I do not think it is the custom as a rule to rate an engine at one-fifth cut-off on 80 pounds of steam. If it has 80 pounds of steam it usually carries the steam a great deal further along the stroke before the cut-off. Of course, an engine can be worked in that way, if used with economy, but the ordinary builder's rate is about one-quarter cut-off, and on that basis this engine would give a great deal more horse power than the paper indicates.

Mr. Lloyd—The reference to that particular engine was taken from the table, and there are variations from the amount of power which would be developed. At 100 pounds pressure the engine would develop 142-horse power. That particular point was made to show that the weight of the flywheel required on a gas engine is not unduly great. It is popularly supposed that a gas engine is about all flywheel. But in this particular class of duty, which is exceedingly severe, the weight is not more than would be good practice in a steam engine of about the same character. I mention 80 revolutions because at 80 revolutions the steam engine would receive the same number of impulses per minute that the gas engine with full load would have when running at 160—that is, double the speed of the gas engine. The matter of regulation, which seems to be rather high, is due to the division of the impulse, and that is why the tandem engine is able to give much better regulation than the single cylinder, because there are twice the number of impulses. An analysis of the load carried will show that the single-acting engine cannot receive more than one impulse in four strokes, whereas the tandem engine receives one impulse at every stroke. That necessarily greatly decreases the weight required for the flywheel. If, in addition to that, the governor of the admission charge is sensitive to an extreme degree, the weight of the flywheel will then take care of any possible variation in voltage. The variation which Mr. Templeton, I think it was, mentions in a 50-horse

power engine, driving 300 lights, is rather severe in this sense—that it would be only 6 lights per horse power. If it were running at half load that would amount to 12 lights per horse power. and if, in addition to that, it had an elevator on its hands it would be pretty well loaded. As for the voltmeter not showing more than 1 or 1½ per cent. fluctuation, the dead beat voltmeter will not show all the fluctuations that take place, for you can see them with the eye when the voltmeter does not show them; but if you have a sensitive test voltmeter it will tell a different sort of story.

Mr. Seamon—At the Pittsburgh Exposition, having a chance to examine a direct driven dynamo by the aid of a gas engine, I took enough time to observe the voltmeter, and also to make some inquiries with regard to variations of voltage. In this particular instance it run about 3 per cent. The electrical engineer has recognized that he must obtain a more efficient method of generating and distributing his energy, and more especially in large cities. That being the case, it is my opinion the gas engine builder will be called upon to serve him. The transmission of electricity by the agency of copper is very expensive in cost of installation and maintenance, and there is also a loss in the energy transmitted. In this connection I refer you to the paper by Max Osterberg, in *Engineering Magazine* for December, where he asks: "Are Central Stations Doomed?" He answers the questions by stating that, to those who are close observers of the installation of isolated plants, and the number that have already been installed, the question has answered itself. In regard to the variation of the load and voltage of a dynamo propelled by a gas engine, I desire to call your attention to *Engineering Magazine* for November, 1896, p. 265, when tests were made at the Bordeaux Exposition, 1895, with a Crossley 80-horse power engine. The engine was of 17-inch bore, 24-inch stroke, with one flywheel 17,600 pounds weight. A liquid resistance was used, and the engine was loaded to 80 horse power. There were scarcely any variations indicated by the voltmeter, on account of the weight of flywheel, which overcame the impulses of the piston. This is conclusive evidence for me to state that much depends upon the weight of the flywheel to overcome the variations of voltage.

The President—This discussion is a very interesting one, and I do not feel like closing it yet. Others are present who can give us some information, and we would like to hear from them.

Mr. Whysall—While some of our friends are making up their minds as to what they are going to say, I would like to speak a word about indicating engines. We furnish fuel gas for a great many steam plants. My own practice is to first, if possible, indicate every engine, make a general examination of the plant, keeping a record of that, and occasionally going back to see how they are getting along. We sometimes find a very good steam plant in a horrible condition; for instance, a high pressure cylinder of a compound engine pulling a low pressure cylinder—just dragging it along. In such case they would make a great saving by cutting it off. Then, again, we find engines "blowing through"—the steam partially blowing out of doors without doing any work. We have in some instances made contracts at fixed prices per month for furnishing fuel for steam plants, based on their fuel bills; and after having had them overhaul their steam plant get an unusually good price for our gas—I will not say what rate per 1,000 cubic feet, but we know what it is. I think if the same plan were pursued with gas engines the gas consumption would be cut down, which is a very necessary thing to look after where manufactured gas is used.

On motion of Mr. Cline, a vote of thanks was tendered to Mr. Lloyd for his paper.

The President then introduced Mr. J. F. Seamon, of Uniontown, Pa., who read the following papr, entitled

SOME FACTS RELATING TO GAS AND ELECTRICITY.

[For Mr. Seamon's paper, see JOURNAL, Feb. 15th, page 244.]

Discussion.

The President—I hope Mr. Seamon's interesting paper will be discussed in all its bearings. Perhaps Mr. Holmes can give us some information on this topic.

Mr. Holmes—I do not like to advocate electrical interests at a gas meeting, but having had experience in both of these lines of manufacturing and distribution, I have had quite a contrary result from that indicated by the writer of this paper. It has perhaps been forced upon us by the fact that having natural gas in our territory it is against our interest to have the gas engine developed as an economical means of power. I think that, with gas at 25 cents per 1,000, only a few gas engines are in use in our city. All such engines use gasoline. The conditions existing there have probably made it necessary for us to bid for electric power on a lower basis than is desirable under ordinary conditions. The comparison drawn by the writer of the paper with regard to storage seems to me hardly applicable under our conditions. With us the storage of electricity hardly comes into the question at all. And then, I notice that the paper does not take into consideration the cost of distributing gas for use in gas engines—which many of us know really costs more than putting the gas into the holder—so that, in this respect, the comparison is hardly brought down to an equal level, in my judgment.

Mr. Seamon—In reply to Mr. Holmes, I presume he has a competitor in natural gas, and he is put in the same position as a gas man against an electric light station with water power. I do not recognize them in one sense as competitors, where they are dependent in an indirect way upon Providence as to their source of energy and product. We cannot compete against natural resources. The gas man is not in a position to avail himself of the direct utilizing of them, I am sorry to say; but it shows us the course of electrical engineers, who, by their applications of utilizing power at Niagara Falls, sought the most economical methods of generating their energy. I would like to say again that if the problem of storage and the transmission of electrical energy could be solved by the electrical engineer as efficient as compared to gas, then I would advise you to sell your gas stocks; because I fully believe that if it is solved, and solved upon as efficient a basis as the gas man receives, then it will put both products upon an equality as far as the cost of storing and transmission is concerned. The electrical engineers say that the transmission of electrical energy and the storage of the same are the two greatest problems they have to-day; and they are being given considerable attention. The Westinghouse Company has recognized the fact that gas engines must be used for the generation of electric energy. In their plant to-day they are experimenting with an engine of about 275 horse power, which I saw them working on at the time I visited the plant—about one year ago. The small engine to which I referred in my previous remarks in the discussion of Mr. Lloyd's paper was this style engine, only in a smaller unit—I think it was about 20-horse power. The cylinders are of the vertical type, and they claim that the results obtained are very satisfactory in every respect.

Mr. Doherty—I would like to ask Mr. Seamon how cheap they sell electricity in his company in effecting the saving which he has stated. It would be interesting to know what prices are charged where that saving is made. I refer to his statement that, "Where gas dispelled that of electric light of equal luminosity, a saving of 71½ per cent. was gained in favor of gas." There is another thing in connection with this paper to which I wish to refer. I think that a great many gas men do not fully appreciate what a competitor an electric light plant may be. I have attended one or two electrical conventions. One evening I was talking to several central station men, the majority of whom admitted they did not know how much current they sent out. They had no meter for consumers; they did not know how much coal they burned per horse power; they did not know how many pounds of water per horse power it took to run the engine; and yet some of those fellows are "staying above ground." I do not believe that many of our small gas plants could "stay above ground" if they did that. On the other hand, it is possible to get a horse power at an expenditure of 2.4 pounds of coal—one engine manufacturer recently offered to sell an engine and guarantee a horse power on 13 pounds of water, and 15 has been reached actually (that is with the condensing engines). It is becoming the practice now, or is bound to become the practice, to put water meters on boilers, and thus keep track of the firemen; to put station recording wattmeters on the switchboard, and thus shut off the meter and transformer losses. When an electrical station is equipped with good boilers and engines, with water meters on the former, to check each day the weight of water evaporated per pound of coal, and wattmeters on the switchboards to check the workings of the engines and the work of the men in the station house, and at the end of the month to check the meter losses and the transformer losses, you will be surprised to find how cheaply electricity can be furnished. In the matter of lamps, I may say they may cut a great deal larger figure than they do now. The cost of the renewal of lamps, if a station had been so unwise as to attempt to keep up free renewals, will be very great. It would pay all gas men to investigate that subject, and, having investigated it, I think a great many of them will feel like buying up the electric plant in their town—a thing it is very often advisable to do.

Mr. Seamon—In answer to Mr. Doherty I will state that the price in the comparison which I made was ¼ of 1 cent per ampere, the gas rate being $1.35 per 1,000 cubic feet.

Mr. Doherty—At what voltage?

Mr. Seamon—At 50 volts. With a 16-candle power lamp, that is ¼ of a cent for one ampere hour. I would like to ask Mr. Holmes if there is an isolated plant in his town; and, if so, by what means it obtains its power?

Mr. Holmes—I think we have from 15 to 18 isolated plants in our locality.

Mr. Seamon—Do you furnish power to any of them?

Mr. Holmes—To many of them. Those who use arc lights furnish most of them themselves. Our manufacturing plants, which are very large, being generally located in the suburbs, are so located that we cannot very well cater to their business. We do not have a great many small manufacturers, so there is not a great deal of need for small power. What there is of that nature we have attempted to take care of with electric motors.

Mr. Seamon—You are running a combined plant, I presume?

Mr. Holmes—Yes.

Mr. Seamon—That is what I thought, judging from your first remarks in the discussion.

Mr. Doty—I recently read some tests of a "Madison plant," and it might be interesting if the gentleman from Madison would give us the result of his experience—especially in following the trend of losses in efficiency. For instance: He evaporates 13 pounds of water per pound of coal, and with that steam he gets more horse power out of his engine. Taking the figure mentioned a few moments ago of 2.4 pounds of coal per horse power, and then considering that 13 pounds of water are evaporated per pound of coal (this is not his own experience, but it is well known that a pound of coal will evaporate 9 or 10 pounds of water) we see that there is a distinct loss at once. When we get the steam into the engine, we have an indicated horse power, but when we transform the energy of the steam engine into the electric engine there is quite a large loss. Perhaps the ratio of electrical energy to indicated horse power would be something like 70 or 75 per cent. Carrying it further: The transformer loses 40 or 50 per cent. depending upon the kind of transformer; next, there is the meter loss and the line loss; wherefore, you hardly realize 12 per cent. at the burner of the energy of the coal. Putting these losses together, they represent a considerable amount. The Madison plant is referred to in the "Engineering Transactions" for this year, and I was quite interested in reading the results.

Mr. Lloyd—I was about to remark, before Mr. Doty mentioned the matter, that I think the kernel of the nut is the cost of fuel per unit of power. I would like to ask some one running a combined plant as to the amount of fuel consumed per electrical unit, so that we can make a fair comparison.

Mr. Doty—I would say about 12 pounds of coal per kilowatt hour.

Mr. Lloyd—It would be clearer for me were the statement made in horse power in the engine; for I am not fully conversant with electrical current.

Mr. Doty—Seven hundred and forty-six kilowatts is an electric horse power.

Mr. Lloyd—And that is about one half the indicated horse power of an engine?

Mr. Doty—Perhaps you can realize 70 per cent. of the indicated horse power in electric horse power.

Mr. Lloyd—That would make in the neighborhood of 8 or 9 pounds per indicated horse power as the fuel consumption in a well regulated steam plant?

Mr. Doty—Yes; at the rate of 8 pounds, with the engine fully loaded for the complete time of a day.

Mr. Lloyd—The present development in gas engine power will give a horse power of 0.8 to 1.25 pounds of coal per indicated horse power. In fact I think the steam plant has a long race to run before it can overtake the gas engine.

Mr. Doherty—I have two or three things to answer now, as Mr. Doty has me on the string. The efficiency of the gas engine is probably four or five times as great, per number of heat units given out, but it works on a great deal more expensive fuel; still, of course, you have the application direct.

Mr. Lloyd—Do you mean with coal, or coke?

Mr. Doherty—That is with coal gas.

Mr. Lloyd—I refer to producer gas.

Mr. Doherty—With regard to 7 or 8 pounds, at the dynamo brushes, per horse power, I think that is very apt to be the ordinary practice, but, at the same time, it is a long way from the possibility. It is a good deal like taking what is accomplished in the best gas works of the country and comparing such with results obtained in gas works installed and run in about the same manner that electric light plants are. You perhaps go to electrical conventions once in a while, and you go to gas conventions; and I believe that gas plants as a rule are run much better than electric plants, because the gas people are older in the business; yet they ought to realize a great many more kilowatts from that quantity of coal. We have made some tests in our power house and have increased our efficiency since the tests were made. We have one boiler—some boiler manufacturers say it is no good—but with it we have evaporated over 12 pounds of water per pound of combustible.

Mr. Doty—Did Mr. Lloyd's remarks in regard to the efficiency of the gas engine concern one pound of coal per horse power hour?

Mr. Lloyd—One pound of coal.

Mr. Doty—My point is in the story I was going to tell about Mr. McMillin, showing the insight of the man. At a meeting of Mechanical Engineers the subject of the gas engine was being discussed. An Englishman who was present was giving some figures showing the efficiency of the oil engine. He said that it used a pound of oil per horse power per hour. Another gentleman said he used 20 feet of gas, which weighed a pound. Mr. McMillin instantly said: "Do you use a pint?" He said "Yes." "And do you use a pound?" "Yes." Then Mr. McMillin said, "A pint is a pound the world around." So you can always keep that figure in your mind—that a pint is a pound, and that will give you the efficiency in horse power.

Mr. Whysall—This matter is becoming very interesting to me. I made a test a short while ago on an engine running 270 revolutions, driving a 1,000-light alternating dynamo, connected to two miles of primary circuit, and having transformers of 450 lights in light burning capacity; the engine indicated 3½-horse power. Now if the loss on the line and the transformer loss are as great as is claimed, why did it not require a greater amount of power to keep that engine going? That was the indicated horse power of the engine, and covered friction of generator, belt, line and transformers.

Mr. Seamon—What was the voltage.

Mr. Whysall—Fifty-two volts.

Mr. Doherty—Of course one arc lamp would get a certain amount and another a different amount.

Mr. Whysall—They averaged up. When I mentioned the matter I had in mind the alternating circuit.

Mr. Seamon—I do not understand how Mr. Whysall arrives at the statement that, having 2 miles of wire, and furnishing 450 lamps at 52 volts, he only got an indicated horse power of 3.5; for if we reduce that to watts, and divide by 746, we get a product of 30 E.H.P. There is something wrong, because if that were accomplished the electrical engineer is on top.

Mr. Holmes—That seems plain to me; he had about 400-light capacity in the transformers.

Mr. Whysall—But no lights burning.

Mr. Seamon—I did not understand it that way.

Mr. Holmes—With 2 per cent. line loss that would give him about one horse power, and the loss in engine would make up the difference. That seems very plain.

Mr. Seamon—I did not understand it in that way. You were just simply testing the line loss, and the loss on the transformers. I inferred, when you made the statement, that the lamps were burning.

Mr. Whysall—We looked to that to see no lamps were burning.

Mr. Gwynn—Do you adjust your lamps at 61 or 66?

Mr. Whysall—At 65, with 28 lamps on. When 68 are put on we reduce it to 61.

Mr. Gwynn—Were your lamps adjusted with the voltmeter so that you knew whether they were up to voltage or not?

Mr. Whysall—I would not like to say whether they were up to voltage or not.

Mr. Gwynn—The adjustment of the lamps to voltage would itself take about two-thirds of a horse power per lamp—if they were up to voltage. If you put lamps on circuit adjusted to 50 volts, to carry 9¼ ampere current at the station, in order to give you the 2,000-candle power lamp required, it would take about 66 per cent. of a horse power lamp alone, without any loss on the circuit at all. The United States standard now is a 540-watt lamp.

Mr. Whysall—Would not the carbons make a difference?

Mr. Gwynn—A high resistance of the carbons would make a difference.

Mr. Whysall—When you change the carbons you are liable to go away off.

Mr. Gwynn—When you put in a poor grade you must adjust your lamp to make up for the resistance of the carbon; if you use a good grade of carbon you will find the resistance very slight; but if you use

poor carbon you will have to adjust your line to a higher voltage to get the 2,000 candle power. The standard now for a 2,000-candle power lamp, as adopted by the National Electric Light Association, is a 450-watt lamp, and the test is to be made at the terminals burned on the circuit and not at the station. To make it suffice, you would have to adjust the lamps at about 475 watts at the station. If you figure that on 720 watts, you would find your lamps, at two-thirds horse power, would be about 63 per cent. That is, using two-thirds horse power per lamp you would use up 63 per cent. of the power. When the lamps are allowed to get out of adjustment you easily do that—if they are up to adjustment, in fact, you use more current than that. In Mr. Seamon's comparison of the cost of gas and electric light equipments, he over looks the cost of the distribution of electricity. I cannot give the exact figures, but I think it pretty safe to say that it costs 10 times as much to maintain an overhead wire as it does to maintain a street main. In distributing gas the cost is very much lighter for maintaining the distributing plant than is the case with overhead electrical work. Your line comes down very fast, and you are soon called upon for reconstruction, without having made allowance for the giving out of installation. The breaking of poles and the cost of lines removed increase electrical distribution charges very rapidly. After every storm one finds something to do in the way of repairs. He forgot that part of it. Let them solve the problem of storing electricity; the gas companies will still be in existence and gas stock will be at a good price.

Mr. Seamon—From what knowledge I have of electricity, I am inclined to agree with Mr. Gwynn. There is no question that the electrical engineer will achieve a great victory when he gets an efficient method of storing electricity.

Mr. Gwynn—That I will admit.

Mr. Miller—I do not think it is a fact that it is beyond all question that the electrical engineer would gain such an enormous amount by the storing of electricity. The electrical business is comparatively new. It is old and hackneyed to say electricity is a new business, and its possibilities are not recognized; but I think that all of us recognize pretty thoroughly the possibilities of electricity in general. I think, however, that very few of us recognize the possibilities of central stations. The electrical business is now something like what the gas business was 15 or 20 years ago. At that time, with a majority of gas plants, a station meter was a luxury. About the only account that gas companies kept was the cash account. They paid out money for coal and labor and took in money for gas consumed; the difference in the amounts at the end of the year represented the profits. I think very few of the central stations have any idea of what they are doing. I know a large number of large central stations in this country consider that a steam indicator is an unnecessary luxury. They have run a large part of the time with the low pressure cylinder pumping—in other words, dragging it after the high pressure; we know that their coal consumption is enormous, and that in every way they are running badly. In spite of this many of them are paying dividends. Another thing that goes against the electrical companies is the enormous depreciation. As electrical companies have been started they have usually been organized by the manufacturing companies; the manufacturing companies have milked them and bled them in every possible way. They made them put up for rights, and pay three or four prices for apparatus, and after working off on them all the old apparatus they had in stock, they left the local men to hold the bag. The result has been that after a few years' running most of the machinery is so antiquated that it pays to throw it away, and there is an enormous depreciation to be charged off. If any of you gentlemen were to start in to day to erect a new central station you would get the best machinery you could find, you would buy first class engines, and put up the best kind of a plant that could be built, and hire good engineers to design it. I do not think that the question of storage would cut much of a figure. The capacity would be cheaper possibly than the storage—I mean the extra generating capacity would be cheaper than the storage capacity—and the cost of operating would not be very much increased in a well designed plant. That is, the difference between operating a steady load and operating an irregular load would not be very great. I propose to hold on to all of my gas stock, for I think that *we are the people*, and we are going to get there, but at the same time I think we are not doing ourselves just ice in closing our eyes to the fact that there are great possibilities in the electrical business. If you will take the published reports of these companies and go over them carefully, and then, if possible, get into the stations, you will see what chances there are for improvements in those very stations. You will see where large savings can be made. I do not suppose many of us claim to be experts in that line—in fact, I have not heard that any of the gentlemen here claim to be experts, but at the same time we have scattering information on the subject, and can often in those stations see where they could save lots of money. In spite of this even those stations are paying dividends to day.

Mr. Gwynn—Very few.

Mr. Miller—A good many of them are paying dividends, and there are a great many of them who are earning a good deal of money that are not paying dividends for the reason that their depreciation has been so enormous that they cannot afford to pay dividends. They have an enormous capitalization—probably a plant which is worth about $150,000, if a careful inventory were made of everything, is capitalized at $700,000—that amount of money having been paid out for rights, and for machinery at enormously high prices that would scarcely be bought up for junk in the market to-day. Therefore they are not in a position to pay dividends. Nevertheless, with new machinery they would be able to pay big dividends on the actual cost of erecting a new plant. There are large possibilities in this business, and yet I do not believe they are going to hurt us much. Although I am not afraid of them, I do not believe in sitting in our offices and running them down. We should strengthen our position in every way possible, and be in a position to defeat them at every point.

Mr. Doty—As a final thought, apropos of Mr. Miller's suggestions and of Mr. Seamon's statement that, "It is to be hoped that the electrical engineer will fully realize that he comes as near getting electricity direct from coal, through the agency of the gas engine and dynamo, as can practically be obtained at the present day," I will say that that brings to my mind the remark that Mr. Humphreys made two or three years ago, when there was a contest between water gas engineers and coal gas engineers, that "To-day, of course, we recognize no division line." It seems to me that the thought in the mind of engineers to-day is that we are neither gas engineers nor electrical engineers in any narrow sense, but that we are going forward as light engineers.

Mr. Gwynn—Mr. Miller suggested that he did not think the matter of solving the problem of the storage of electricity would amount to much, but I am inclined to think it would amount to a great deal. Where they now run with a day business, after 12 o'clock they could store the same amount as they are now using, and through the daytime could shut down and shut off a certain amount of engine after a certain hour of the night, if they had a storage battery which they could use. Of course, in the larger cities, where they have a large business, it would not affect them so much; but in smaller cities it would be a wonderful help to them and would make their returns very much better.

Mr. Seamon—At Germantown they are doing it at this time.

On motion of Mr. Gwynn a vote of thanks was tendered to Mr. Seamon for his paper.

The President—Next in order is the paper by Mr. Irvin Butterworth, of Columbus, O., entitled

A CURIOUS GAS EXLOSION.

(For Mr. Butterworth's paper, see JOURNAL, Feb. 15, p. 246.)

Discussion.

The President—The paper is now open for remarks, or for any questions.

Mr. Miller—It would seem, from the position of this holder and the direction of the wind, that, as Mr. Butterworth suggests, all the gas should have been blown out of it. I think his last theory is very much more plausible than the other—that is, that the explosion was probably caused by an accumulation of light oils on top of the water, which kept the holder full of an explosive mixture.

The President—Cannot Mr. Harbison enlighten us on this question?

Mr. Harbison—In our neighboring village of New Haven, a few years ago, a holder went heavenward after being out of use for three years. I wish Mr. Sherman would tell you about it, as perhaps further illustrating this theory of the evaporation of light oils.

Mr. Sherman—I think Mr. Harbison has told us all that I know about it. It occurred before I went to New Haven. The facts of the case were that this holder had been out of use and the manhole open for three years. A boy dropped a match into it, and of course the boy who dropped the match came down in pieces, which would go to show that an explosive mixture was there. The gas company were censured for not taking care of it and not protecting it.

Mr. Coombs—Did the holder contain water?

Mr. Sherman—It was partially filled with water.

Mr. Coombs—And the manhole was taken off the holder?

Mr. Sherman—Yes.

Mr. Coombs—Was there a circulation of air from the bottom up to the manhole?

Mr. Sherman—No.

Mr. Coombs—Then of course the fact that the manhole was off in that way would not help.

Mr. Sherman—We all know that nine parts of air and one part of gas make a very explosive mixture.

Mr. Coombs—If the manhole had been taken off and there had been ventilation from the bottom of the holder, perhaps there would have been no explosion from the match.

Mr. Sherman—Very likely not.

Mr. Coombs—Some years ago our people had to repair an old holder. About that time I read an account in a gas paper of an explosion in Michigan where the manhole plate had been taken off from the top, and the holder let down into the tank. Having been in that condition for probably two weeks, the holder blew up. No ventilation came from the bottom. We were working at ours at about the same time. We took off the plate on top, and also cut underneath the holder at the bottom, so as to make a ventilation through for about two days. Then I went down into the tank (I had them tie a rope around me first) to see if it was all right, and I found it as free from gas as could be. I believe that if ventilation could be secured in a holder there would be no danger. This cut in Mr. Butterworth's paper shows that the holder was tipped up at one side, and there was a line drawn from the hole or opening at *C*—a straight line is drawn right through; that indicates to me there was an accumulation of gas at the point marked *I*, where it could not get out. There would be a mixture there. How it exploded and caught fire is a mystery. We are pretty sure it would not explode unless fire was put to it in some way, but how that came about is, I suppose, a mystery.

Mr. Whysall—If the purification had not been complete, or had not been very good, would it not be possible for the sulphur compounds to adhere to the walls of the holder and ignite from the action of the air? I have had a little experience with that in natural gas. There is considerable sulphureted hydrogen in the gas, and at times we find a deposit of flour on the inside of the pipes and in the fittings, which on exposure to the air ignites. I think that a plausible explanation of the origin of the fire in this instance.

Mr. Coombs—Does it explode, or does it just burn?

Mr. Whysall—It burns.

Mr. Philipp—How was the atmosphere that day?

Mr. Butterworth—It had rained for an hour or so.

Mr. Philipp—Was the atmosphere clear or heavy?

Mr. Butterworth—I do not remember about that. It was the kind of atmosphere that you would naturally find when it had stormed; it would naturally be moist.

Mr. Philipp—I remember being told by a friend of mine, in the oil business, of a peculiar explosion in the oil country, near Bradford, Pa., about ten years ago. In a valley of considerable extent there were several flowing oil wells. The explosion occurred on a dark, rainy day. The atmosphere was very heavy. A well had been flowing oil and gas together. A mist seemed to settle over the valley, just like a fog. About 300 feet away from this well there was a boiler under fire. An explosion took place, the gas and oily vapor taking fire, and it seemed as if the whole valley was in flames. There was nothing but the pressure of the atmosphere to hold that mixture of air, gas and oily vapor down. Of course we all know of explosions, the causes of which are not as plain as they should be. The conditions of the atmosphere help us at times to theorize and find out the cause. That is the reason why I asked as to the atmosphere in that locality at the time of the explosion.

On motion of Mr. Doherty the thanks of the Association were voted to Mr. Butterworth for his paper.

At the invitation of the President, Mr. E. S. Templeton, of Ashtabula, Ohio, read a paper on

ADVERTISING.

(For Mr. Templeton's paper, see JOURNAL, Feb. 15, p. 247.)

Discussion.

The President—This very interesting paper will bear considerable discussion.

Mr. Doherty—I think this is a very good paper, but I have some criticisms to offer. Much of it should be printed in italics, because it is to my mind a matter of vital interest. I believe there is a new school of gas men (I am proud to say I want to hang on to the tails of that new school, or to be in it in some way), which school believes that money is made by selling a whole lot of gas. The policy has been established in many towns of selling gas stoves at cost. I think that is almost universally the case. In many places gas men had advocated the giving away of stoves. I do not believe in that. I do not believe in selling them for cost. If you will take the lines of business that have been most successful, you will find that they have been those which had the largest margin of profit in them, and that margin of profit has been given to the agents working up the business. Take typewriters, or pianos, or any other thing of a kind which has come into universal use and has become an absolute necessity. When we see their immense sales I think we are justified in believing that we could increase our output at an expense which the average gas man does not realize. At Madison, Wis., the Company I am connected with advertise in the daily newspapers. Every newspaper that comes out has some of our "ads." in it. One man said, "Doherty, if you will take that advertisement out of the paper I will buy a stove of you." The advertisement is at the head of every local column in the newspaper, and we keep one there as a permanent thing, although we change it at regular intervals—sometimes on account of the weather, but ordinarily we change it once a week. I am sorry that I have none of them here to show you, as I think it might be interesting. We change our advertisements often. When this cold snap came on we called attention to the fact that if any portion of a house was not properly heated, a gas stove could be bought for so much, and tubing for so much per foot, and the rooms could be made comfortable at a very small expense, while the cold snap lasted. Last summer when I went to Madison we were late in getting started in the gas stove business. We had a gas stove exhibition, which cost us considerable money, but it was fairly satisfactory, and we ran it for one week. My idea was to get the ladies of the town started, and then see if we could not keep up the same thing. We were successful in that respect. A ladies' society organized and became one of the largest organizations in Madison, and it is now the largest woman's club in the State of Wisconsin. They carried on a cooking school for eight weeks. We are now arranging for a five months' cooking school to be run in connection with the public schools. I am studying out a plan whereby I think that gas companies can safely fix what amount they can use for advertising purposes. If a company can afford to give away a gas stove, and connect it up, that represents $15 for every stove. If they can sell that stove for $15 then they ought to be able to use that $15 for advertising purposes; and I am sure that a person who buys a gas stove and pays for it will think a great deal more of it than he will if it is given to him. And there is an additional advantage in selling. The consumer is very apt to feel that if a gas company is able *to give* him a stove one year, it ought to be able to do something for him the next year, even if he does not ask it to give him another gas stove. But I do not believe in that policy, although it might be a good thing for a final run. Before I went to Madison I was in the employ of the Columbus Gas Company, and as we were all interested in pushing the Welsbach light against electricity, one of the plans adopted was this: I had a record in my office of every store in Columbus using light; and by referring to that record we could tell just whom it was likely we could influence to adopt the Welsbach light, and our main business at that time was in interviewing the men again and again, to get them to use the Welsbach. When we started in, practically every store in the city was using the electric light, but in less than one year at least seven out of ten stores that kept open at night were using the Welsbach light; and we had dozens of them that ran every night until very late. I expect to adopt the same principle at Madison that I adopted there; and I expect to know how every house is lighted, and what they use for culinary purposes, and expect to work on that knowledge and send circular letters and postal cards. We sold last year in the neighborhood of 150 gas stoves, and figure them worth $15 each for installation. If we had chosen to say that we were willing to reinvest $15 for advertising purposes for every gas stove sold (and I think it would be well to make some sort of rule like that) we would have had about $2,200 to use for advertising purposes. But we have not used half of that. I anticipate that we will sell a great many stoves this year; and, in fact, have sold six already this month, where they were preparing for spring, and in one or two places where they made changes. There is one part here which I have marked, and which I will refer to again. I believe that every company with an output of, say, 10 million feet—or, I will say, in every town of 10,000 inhabitants—would find it to pay to keep one man at work doing nothing else except in the way of efforts to increase the consumption. It might not pay the first year, but I venture to say you would not be out of pocket by the year's business, and you would gain business which would probably stick to you for a number of years. In large towns the only practical way of working would be to divide the

town into sections, and then let one man take care of whatever area it was possible for him to take care of, and to know exactly what was being burned in every house. In the factories there is an unlimited field for introducing gas. I induced one concern in Madison to use gas instead of gasoline for their enameling furnace, and they have become a valuable consumer. All it took by way of inducement was to walk over there and use a little chin music.

Mr. Miller—I think Mr. Templeton has a pretty high opinion of human nature when he says there must be some merit in an article in order to be successfully sold. You may take a good article, and put it on its own merits, and take an absolutely worthless article and well advertise it, and I will bet you any money that the advertised article will win every time. There is a "sucker" born every minute, and he is always anxious and glad to get caught. Mr. Templeton suggested an idea which I do not think he carries quite far enough. I would like to give it a little emphasis. I met a newspaper man some years ago (he had an intimate knowledge of the gas business), who said that it was a good deal cheaper to keep on good terms with the newspapers than it was to buy them when trouble comes. He said that if you put into a newspaper, depending on the size of the company, from $50 to $500 every year, it would always be your friend; you are their customer, you keep in touch with them, and they are always your friend. If you get into trouble you would be willing to pay $500, or $5,000, or $50,000 for the use of the editorial columns of the paper, but you cannot buy them. You cannot buy friends. You must make them. This man was a newspaper man who knew the tricks of the trade. I have since used that information to very good advantage, and have reason to know that the statement is true. I have seen a paper which attacked the local company daily; they felt that they were not doing their duty by the public unless they came out and made some unpleasant remark about the gas company. But after giving them an advertisement, and giving them a little printing, and going around and seeing the editor occasionally, they became perfectly willing to come out and say that their city had the best gas in the country, and that the gas company was a credit to the town. This particular man who gave me this good advice is interested in a gas plant in a town of about 5,000 people, and by manipulating the advertisement business he has reached an output of 17 million feet. I do not know whether any of you recognize him from that description.

Mr. Templeton—What is the price of gas there?

Mr. Miller—About $2. A man came into my office a few days ago and threw down on my desk a handful of loose sheets. On them were pictures of various kinds. There were one or two pictures of kerosene cans exploding on a range, with the servant girls soaring skyward. One represented a woman standing over a coal stove with much of her anatomy running over with perspiration. There were a number of things of that kind. He said, "I want you to purchase that advertising matter." It struck my eye at once, and I investigated it and talked with the man for half an hour or so. It seems that there is a company down town—I do not recall the name of the company now—which furnishes matter for newspaper advertising, or circular advertising, or anything else of that kind, at regular intervals of a week or every two weeks perhaps. They charge only 50 cents for a cut and reading matter. The purchaser has the right to reject the cut if it is not satisfactory. These cuts are mailed every week, and if they are not satisfactory you can send them back and no charge is made for them. The only charge is 50 cents for cut and reading matter if they are accepted. You all recognize the advantage of changing an advertisement periodically. If it runs too long people will say that it is an old chestnut, and they do not read it; they look over it by a sort of reflex action, and it does not make any impression upon the mind. But if you will change the advertisement every day people will notice it, because their attention is attracted by it. With regard to the house to house canvass, I will say that I have had more luck with that than with anything else. I have paid my canvassers—I am now speaking of Long Island City—so much on each meter; and with the combination of paying canvassers a commission, and reducing the price of gas from $2 to $1.25, I have increased the meters from 1,400 to 3,200 in two years, and increased the output correspondingly. Of course, not all of this gain is due to the canvassing alone, or to the reduction in price alone; but it was the combination of the two. It indicates what can be done by systematic canvassing. I adopted the suggestion of keeping a record of each house, but instead of keeping it in books I keep it on cards, which I file, so that I can readily put my hand on any particular card. In that way I keep tab on every house, and know whether the occupant is the owner or a tenant, and whether it is piped, and whether it has a service. In that way I know all about it. I think that all of us agree that the only way to sell gas is to advertise and keep ourselves before the public, giving them to understand that we are "The People," and that they must come down and do business with us.

Mr. McCook—How large was the increase in population in the two years?

Mr. Miller—I presume the increase for the two years is about one-half of one per cent.

Mr. Templeton—I would take exception to Mr. Miller's remarks as applied to gas companies, or to any concern where the custom is limited. You may find "suckers" all over the country, that you can catch once in a while, but you cannot keep on catching them. In our business it is necessary to make good gas and to give good service, and to furnish the gas at a fair price. As an illustration of what persistent work can do I will say that in the last half of 1896, the output of one company that I am connected with was 95 per cent. more than for the last half of 1895; and it was gained almost entirely by advertising, canvassing and pushing the sales. Of course it was a field which had been very much neglected, but such was the result in that one place.

Mr. Miller—I trust members will not think that I do not believe in giving good service—the best service—and in doing everything I can for the benefit of the consumer. I think that a happy and pleased customer is one of the best methods of advertising. I made that general statement because I thought that Mr. Templeton had too much confidence in human nature.

On motion of Mr. Butterworth the thanks of the Association were voted to Mr. Templeton for his paper.

An adjournment to Thursday, February 4th, 1897, at 10 A.M., was ordered.

(To be Continued.)

[No. II.]

Some Details of the Displays at the Recent Gas Exhibition, Madison Square Garden, New York, under the Auspices of the Gas Industries Company.

The exhibit of the Continental Iron Works Company, whose well-equipped shops are located on West and Calyer streets, Brooklyn, N. Y., was unique and attractive. The apparatus shown included a beautifully finished self-sealing mouthpiece of standard size, 14 inches by 22 inches; a specimen of an ordinary mouthpiece with pressed steel lids and ordinary cotter bar and screw, with lugs, and one 24 inch gas valve with double gates, fitted with the Company's quick-opening screw device. Two other examples of this valve (16-inch and 10 inch respectively) were also shown. A welded steel corrugated furnace, for internal-fired steam boilers, for land and marine service, came in for much scrutiny. The furnace is 3 feet 6 inches diameter, and 7 feet in length, and is constructed to sustain an external pressure of 200 pounds per square inch. A good example of the "Morrison" protected furnace front and door for boilers was also shown. Perhaps the most interesting items in the Company's exhibit were those going to show its practice in the ingenious and faultless construction of steel welded work, to meet the increasing demand for metal vessels for retaining gas and liquids under extremely high pressures. In this direction were exhibited: A steel flask, for containing liquids under pressures up to 3,800 pounds per square inch, had a diameter of 5 inches and a length of 4 feet. A welded steel vessel for high pressure liquids or gases, of a dimension of 30 inches diameter and 4½ feet long, is guaranteed by the Company to be tested to safely withstand a pressure of 500 pounds to the square inch. Perhaps the gem of the collection, however, was a beautiful specimen of welded steel vessel, in the shape of a bottle, about 18 inches diameter and 3 feet 3 inches in height, which was rated safe at a pressure of 800 pounds per square inch. The exhibit also held numerous handsome photographs portraying other lines of work performed by the Company, such as gasholder construction, steam boiler building and the like.

The exhibit by Mr. M. J. Drummond, 192 Broadway, New York, which was of the composite order, consisted of working specimens of many specialties familiar to the gas manufacturer. In the lot were shown cast iron goods, including main and service pipes, special castings and flange castings, samples of Drummond's patent service boxes, valve boxes, various types of valves, the Watkins pipe jointer, lamp posts, the Collis street lamp, etc.

Another interesting exhibit was that made by Messrs. James R. Floyd & Sons, proprietors of the Oregon Iron Works, New York. Prominent in their display was a working model of an automatic washer-scrubber, designed by Mr. William R. Beal, of the Central Gas Light Company,

New York. It is worthy of note in connection with this apparatus that the results obtained from the working of the first machine installed are reported to have been that, in the use of three-quarters of a gallon of water per 1,000 cubic feet of gas, a yield of 12 gallons of 18-ounce liquor was obtained. Much attention was attracted by a portable facing machine for refacing mouthpieces *in situ*, which device is the invention of Mr. Frank Parrish, the Messrs. Floyds' foreman machinist. The Hearne center-seal for operating 1, 2, 3, or 4 boxes was also exhibited. This apparatus is now made with an improved index, which greatly simplifies its operation. A 20-inch specimen of the Ogden quick-moving valve enabled the visitor to comprehend at once the efficiency of gates of this type. A working model of the apparatus was also shown. Other interesting features of the exhibit were: The Ruscoe self-sealing mouthpiece, a specimen of the "German" mouthpiece, working models of the Green self-sealing lid, and of the Ruscoe-Clark lid, and a self-sealing bridge pipe. It is also worthy of note that in the kitchen of the Garden restaurant was installed an example of the Excelsior dish-washing machine, the sole right for the manufacture of which is possessed by the Messrs. Floyd. The Superintendent of the restaurant said that the machine was in all respects up to the claims made for it.

The exhibit of the Isbell-Porter Company, of New York, was compactly put together. In it the gas man found in operation a rotary exhauster, with engine and governor on same bed plate; a handsomely turned and adjusted 20-inch Isbell valve, of the quick-opening type, operated by hydraulic power—the usual city water pressure being quite sufficient for its actuation; a self-sealing lid of the Brenner type, for mouthpieces; and a 14-inch Isbell inside screw valve, in section, showing the operation of screw, gates and toggles.

The P. H. & F. M. Roots Company, of Connersville, Ind., exhibited one of the Company's latest improved pattern No. 2 gas exhausters, with steam engine coupled direct. The apparatus was shown in complete working order, with piping, gas and bye-pass valves and the Company's patent gas governor. Other matters displayed included a sample of the Company's well-known Acme blower, and specimens of forges, tuyere irons, etc. Mr. Daniel T. Roots, President of the Company, was in charge of the exhibit.

Messrs. R. D. Wood & Co., of Philadelphia, in their display, made a feature of a series of photographs showing examples of the largest holders of most recent construction in this country. Of course, the first in line was the 5,000,000-foot holder, completed in 1895 for the New York and East River Gas Company, which holder is located in Long Island City; and then came the holder finished last year for the New York Mutual Gas Light Company, the capacity of which is 4,230,000 cubic feet—this holder was described in the JOURNAL for Dec. 7, 1896, p. 892. A third holder illustrated was that recently built for the Central Gas Light Company, of New York, which vessel has a working capacity of 2,636,000 cubic feet. Another interesting "composite" picture was that portraying the holders built by Messrs. Wood & Co. in 1896. These were all drawn to the same scale, to convey a correct idea of their relative sizes. According to the plates the firm completed, in 1896, the construction of 15 separate holders, the total storage capacity of which aggregated 10,836,000 cubic feet—maximum single vessel, 4,230,000 cubic feet; minimum, 16,000 cubic feet, which relative figures surely represent "extremes." A division of the display that seemed quite popular was that allotted to specimens of the "cutting-in" specials, which devices render it possible to insert a tee-piece in a line without the intervention of a sleeve. There was also a goodly show of ingenious reducer specials and of indicator posts. Four different styles of retort mouthpieces were shown, as were many specimens of valves and gates. This division of the exhibit was particularly attractive because of the display of several light pressure hydraulic operating valves for coal elevators and other machinery similarly operated.

The display by the United Gas Improvement Company, of Philadelphia, was nothing if not imposing. In respect of weight, floor space occupied, number of attendants, and completeness of detail, nothing had been neglected. Towering over the multitude of lesser things shown by the Company, was a full-size set of standard double-superheater Lowe type of water gas apparatus, with not a link missing in the construction. The set shown was up to an actual daily make of 250,000 cubic feet. Next in importance was a complete water gas works system in reduced scale, showing relief holder, exhauster, purifying boxes, station meter, distributing holder and Connelly automatic governor. Then came a model in miniature of a double-superheater apparatus, partially in section, the excellent scheme of which spoke eloquently of the cleverness of the one who designed and worked it out. Other apparatus and matters shown were: Bar photometers and meter provers; a complete and varied series of sets of apparatus for gas analysis, a collection or assemblage of the materials used in the manufacture of water gas—coals, cokes, oils, etc.—and samples of the raw matertals entering into the manufacture of coal gas. Drawings illustrative of the development of the Lowe system of water gas manufacture were shown in sensible sequence; and amongst the faces in the portrait gallery of eminent gas engineers, that of Prof. Lowe was prominent. The "progressive" drawings were well supplemented by various models of machinery and apparatus. Globes, containing respectively 1 cubic foot of water gas and 1 cubic foot of coal gas, were on display, and analytical statements about each gas were plainly put, the statements dealing, in addition to the analysis details, with the weight, heat unit value and specific gravity of each sample. Continually obtruding itself on the vision was a handsome map showing all places in the United States and Canada where gas is supplied, and the particular marking on it conveyed to the examiner a knowledge of the nature of the gas supplied in each community. An original edition (1815) of F. Accum's "Treatise on Gas," attracted much attention, and looked its age to the full.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

THE annual meeting of the Zanesville (O.) Gas Light Company was in all respects satisfactory to the shareholders. The business of the Company during the year showed a healthy increase, and Superintendent Printz came in for pleasant words over the addition to the consumers' roll in the twelvemonth of 150 names. The election resulted as follows: Directors, M. M. Granger, C. H. Abbot, Alexander Grant, Eugene Printz and Robert Fulton; President, M. M. Granger; Secretary, G. A. Allen; Treasurer, the Citizens National Bank; Superintendent, Eugene Printz.

THE steel work in the new building for the Catholic Protectory, Van Nest, N. Y., will be furnished and erected by the Berlin Iron Bridge Company, of East Berlin, Conn. The building, which is to be two stories in height, is to have a floor supported by steel posts and girders. The roof construction is to be of the steel truss plan, supporting slate covering. The building is to be 60 feet wide and 160 feet long, having projections 61 feet long and about 30 feet wide, on either side at the center, for the organ loft and gallery. The ceiling of the upper floor or main auditorium will be arched, and the gallery is to be constructed of light steel work, thus making the structure much lighter than it would be had the usual clumsy construction of wooden columns been followed.

LAST week we printed the text of the original ordinance that was being considered by the Common Council of Kansas City, Mo., under which it was proposed to consolidate the Missouri Gas Company and the Kansas City Gas Company, the property and franchises of both the named Companies to be turned over to a third Company, thereafter to be formed. The debate on the measure resulted in the addition of two sections to the original ordinance—the latter consisted of a single section, which will be found on page 250 of last week's JOURNAL—the text of which is appended:

"Sec. 2. At the time of the conveyance to such corporation, or within 30 days thereafter, the Missouri Gas Company and the Kansas City Gas Company, or the one of them conveying, shall file with the City Clerk a notice of such conveyance or conveyances, in such form as shall be approved by the City Counselor, which notice shall be acknowledged in the manner provided for the acknowledgment of deeds. They, or the one of them conveying, shall at or within the same time file with the City Comptroller, and pay to the city a sum of money equal to 2 per cent. thereof, a statement, verified as required by said franchise ordinances, of the gross receipts from the sales of all gas sold since the date to which such last payment was made up to the time of such conveyance. They, or the one conveying, shall, at or within the same time, file with the Board of Public Works a statement, duly verified, of all pipes, mains, shut-offs, lamps, lamp posts, buildings and appliances of every kind and nature, purchased, laid, constructed, built or acquired by them respectively, up to the time of such conveyance, and the location thereof, and not shown by any statement previously so filed.

"Sec. 3. After said properties, franchises and works become united in one corporation, all reports, statements and payments which said Companies or either of them are now required to make to the city, or any of its officers, semi-annually, shall be made on the first days of July and January of each year, and all annual reports or statements

required to be made by either of said franchise ordinances shall be made on the 1st day of January of each year."

THE ordinance as amended was finally passed by both branches of the City Council, and was sent on to the Mayor (Mr. J. M. Jones) for his consideration. In due time that official returned the ordinance to Councils with a message setting forth his reasons for his disapproval of the measure. The main objection offered is that municipal ownership under the ordinance would be greatly hampered, for, according to the provisions of the franchises granted the two Companies a year ago, the city, after 12 years, may acquire the gas works by paying the value thereof, wherefore, under the proposed new ordinance, the city would, in dealing with the substituted single Company, in the matter of acquiring the property for operation on public account, be obliged to purchase two plants instead of one. Such is the reasoning of Mayor Jones.

AT the annual meeting of the Chattanooga (Tenn.) Gas Company this executive management was named: President, J. A. Caldwell; Secretary and Treasurer, I. W. Post; Superintendent, James Forbes.

WE understand that the United Gas Improvement Company has been awarded a contract by the Northern Electric Company, of Norwalk, Ohio, for the construction of a gas plant in that place.

AT the annual meeting of the shareholders of the Newark (N. J.) Gas Company the following Directors were elected: Charles A. Lighthipe, Henry C. Kelsey, E. Luther Joy, Henry Powles, Andrew Kirkpatrick, George E. Halsey, Elisha B. Gaddis, George B. Swain and Richard C. Jenkinson.

THE City of Des Moines, Iowa, maintains 501 public gas lamps. The "odd number" is in order so that the city may avail itself to the full pound of flesh and the last drop of blood in the Gas Company's proposition. This was to furnish 500 lamps or less at the rate of $18 per annum each; over 500, at the rate of $17 per annum each.

MR. MATTHEW FARRELLY, the clever Secretary of the Peoria (Ills.) Gas Light and Coke Company, will not come East in the future as often as was his practice in the last two years or so. The reason for this is traceable to the fact that early this month he was united in marriage to Miss Agnes O'Neill of Brooklyn, N. Y. The bride is a sister of the wife of the Honorable Henry C. Miner, of this city.

Mr. C. H. Allen has entered the service of the Marblehead (Mass.) Gas and Electric Light Company.

SENATOR LOSCH, of Schuylkill county, Pa., has introduced a bill in the Pennsylvania Legislature which proposes to create a Board of Gas, Electric Light and Water Commissioners. Under its provisions the Board is to consist of 3 members, to be appointed by the Governor for a term of 5 years, one of whom is to be of the minority party. No person is eligible for a place on the Board who is connected in any way with any gas or electric light or water corporation, or who owns stock or bonds therein. The main office of the Board is to be in Harrisburg, with branch offices in Philadelphia and Pittsburgh. It is to have general supervision over all corporations dealing in gas, electricity and water, and is directed to examine the same and keep informed as to their condition and the manner in which they are operated for the security and accommodation of the public, and to note their compliance with the provisions of the charters under which they exist The Board may enter the premises of corporations and examine books, papers, etc., and is given the same right to compel the attendance of witnesses as enjoyed by a court of record. Every corporation is compelled to furnish the Board with the rates charged by them to customers, and shall furnish copies of all contracts and agreements entered into with any corporation and individual. The Board may investigate the quantity, quality and price of gas, electricity and water, upon the request of the local authorities, expressed by the local authorities, or upon complaint in writing of 20 customers, in a town of less than 10,000 inhabitants, or of 50 customers in the instance of a town or city holding over 10,000 inhabitants. Upon the Commissioners' own volition they may investigate the construction of all such works, particularly those of water companies. After a hearing, the Board may order any reduction in the price of gas, water or electricity, or any improvement in the quantity, quality or service thereof; provided such reduction shall not be ordered to a figure that would prevent the companies from earning 10 per cent. per annum on the capital actually expended. No gas, electric light or water corporation shall construct a system in any town, village or city in which a corporation at the present time operates a similar system, without obtaining, in addition to the other legal consents, the written consent of the Board to construct and operate such a system. The annual salary of the Chairman of the Board is fixed at $5,000, that of the other members, $4,500, and of the Secretary (who is to be appointed by the Board) of the Board, $3,000. The Board may expend $30,000 annually for its expenses, books, stationery, etc. The total annual expenses of the Board are to be borne by the corporations involved. The Auditor General is to determine this by apportioning to each corporation its share, according to its net income. The provisions of the bill do not apply to gas, electric light or water works corporations constructed or operated by a municipality. It is made the duty of the Governor to appoint the Commissioners immediately upon the passage of the act.

THE office headquarters of the Penn Yan (N. Y.) Gas Light Company will hereafter be in the *Chronicle* building.

THE proprietors of the North Attleboro (Mass.) Gas Light Company have announced that on and after March 1st the gross rate is to rule at $2 per 1,000 cubic feet, with a rebate of 30 cents per 1,000 for prompt payment.

THE following notice is being published in the advertising columns of the Norfolk (Va.) newspapers: "The City Gas Company notifies its patrons and the public that for all gas used for fuel, beginning with the gas bill the 1st of March, the price will be $1.50 per 1,000, with 50 cents off for prompt payment, making a net rate of $1 per 1,000 feet in cases where 20,000 feet or more per month are consumed for fuel. It is believed that for small powers, and the heating of churches, halls and other large interior spaces where the demand for artificial heat is intermittent, that at the net rate named gas will be found to be not only more convenient, but also more economical. The climate of Norfolk lends itself peculiarly to heating by gas, for there is frequently the need for a fire for only a short time. With gas as a fuel, as soon as the necessity for the heat ceases the gas is extinguished, the increase in temperature is checked, and the expense is at once stopped. This is found also to apply to the heating of residences even when the amount of gas consumed does not entitle the consumer to the special wholesale rate now named, and especially will this be true in spring and autumn. The officers of the Gas Company will take pleasure in advising with its patrons and with the public to the end that the best service can be obtained at the least possible expense. Gas consumers are invited to make known to the Gas Company promptly all causes for complaint, so that the proper remedies may be immediately applied. The Gas Company is more than ready to render such service free of charge."

AT the annual meeting of the Gas Light Company, of Augustus, Ga., the officers chosen were: Directors, George T. Barnes, H. B. Adam, Leonard Phinizy, John R. Schneider, John W. Walton and Thomas R. Wright; President, G. T. Barnes; Secretary, H. B. Adam.

PAPERS have been filed announcing the incorporation of the New London (Conn.) Gas and Electric Company, which undoubtedly is formed for the purpose of taking over the existing gas and electric light properties of that city. The incorporators are Messrs. Augustus Brandegee, Robert Coit, E. N. Gibbs, Garret A. Hobart (Vice-President-elect of the United States), A. M. Young and George E. Terry.

SENATOR BREWSTER, of St. Joseph, Mo., has introduced a bill in the Missouri Legislature which provides that every city in that State having upwards of 100,000 inhabitants (wherefore the bill applies really to St. Louis and Kansas City) shall appoint an official charged with the duties of inspecting the quality of the gas (and of determining the condition of the meters through which such gas is furnished) supplied in such cities. The inspector is to test the gas at frequent intervals during each year, and any company found furnishing gas that does not equal the standards set up by the city (in respect of purity and candle power) in which such gas is sold, may be fined in an amount not exceeding $500. For each meter inspected he is to charge a fee of 50 cents (to be paid by the company owning the meter), and such fees are to be covered into the State Treasury. The salary of the inspector is fixed at $3,000 per annum.

THE Kerr-Murray Manufacturing Company, of Fort Wayne, Ind., has been awarded a contract by the Galesburg (Ills.) Gas and Electric Light Company, for the construction of a new holder, to rest in a steel tank above ground. The holder is to be of the two-lift order, and is rated to a capacity of 200,000 cubic feet. The tank is to be 82 feet in diameter and 21 feet in depth.

MR. G. H. HOLLIDGE, proprietor of the Merced (Cal.) Gas and Electric Light Company, has notified the residents of Merced that hereafter the selling price is to rule at $3.50 per 1,000 cubic feet—a concession of $1.50 per 1,000.

The Market for Gas Securities.

The quotations for city gas shares were at figures above those of last week. There was some lively trading in Consolidated early in the week, the maximum figure reached being 151½ for a round lot, but yesterday the demand slacked to the dull point. The opening to-day (Friday) was reported at 149 to 149½. New York and East River is firm at a slight advance over the quotations of a week ago. The Cantor-Laimbeer dollar gas measure again looms up, this time because the Committee on Miscellaneous Corporations, of the Senate, in whose custody the bill is, are aggrieved over the failure of the representatives of the Gas Companies of New York city to appear and make their argument against the measure on the day set for the hearing—yesterday. It is ridiculous to suppose that the Companies were not anxious to tell their side of the story, but the fact seems that certain of their counsel were sent word that the hearing had been put over for a week, which word looked to have the color of authority. The meeting of the Committee was called at the original time set, and the Companies were not represented. The cross purposes of this and that look bad—for the Albany end. The legislative situation in general, however, is really unchanged.

Brooklyn Union is steady, although weak as to the stock, whereas the bonds are booming at 109¼ to 109½. Chicago is somewhat easier, as is Baltimore Consolidated. Bay State is dull and neglected, at 11 to 11½. Important developments may be looked for at any time in these shares, and the impression is becoming general that President Bartlett is quite near to being the right man in the right place.

Gas Stocks.

Quotations by Cochran & Close, Brokers and Dealers in Gas Stocks.

35 Wall St., New York City.

Feb. 22.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$35,430,000	100	149	149½
Central	500,000	50	195	..
" Scrip	220,000	..	100	.
Equitable	4,000,000	100	202	..
Bonds, 6's	1,000,000	1,000	105	.
" 1st Con. 5's	2,300,000	1,000	114	.
Metropolitan Bonds	658,000	..	108	112
Mutual	3,500,000	100	225	.
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	.	..	.
Northern	150,000	50	85	..
" Bonds	150,000	1,000	..	98
New York and East River	5,000,000	100	45	46
Preferred	2,000,000	100	74	75
Bonds 1st 5's	3,500,000	1,000	104	104¾
" 1st Con. 5's	1,500,000	..	95	96
Richmond Co., S. I.	348,650	50	50	..
" Bonds	100,000	1,000	..	..
Standard	5,000,000	100	79½	80½
Preferred	5,000,000	100	106	108
Bonds, 1st Mortgage, 5's	1,500,000	1,000	108	..
Yonkers	299,650	50	180	.
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	89	91
" " Bonds (5's)	15 000,000	1,000	109¼	109½
Bay State	15,000,000	50	11	11½
" Income Bonds	2,000,000	1,000	..	35
Boston United Gas Co.—				
1s Series S. F. Trust	7,000,000	1,000	..	85
2d " " "	3,000,000	1,000	70	72
Buffalo Mutual	750,000	100	125	..
" Bonds	200,000	1,000	95	100
Central, San Francisco	2,000,000	..	95	..
Chicago Gas Co.	25,000,000	100	76¼	76¾
Chicago Gas Lt. & Coke Co. Guaranteed Gold Bonds	7,650,000	1,000	94	94¼
Columbus	1,000,000	..	68	70
1st Mortgage	1,085,000	..	..	96
Consumers, Jersey City	2,000,000	100	..	75
" Bonds	600,000	1,000	100	102
Cincinnati G. & C. Co.	8,500,000	100	199¼	200½
Consumers, Toronto	1,600,000	50	184½	187
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..

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DIVIDEND NOTICE.

OFFICE OF WELSBACH COMMERCIAL COMPANY, 40 WALL ST., NEW YORK CITY, Feb. 11, 1897.

The Directors have this day declared a quarterly dividend of two (2) per cent. on the preferred stock, payable on Mar. 10, 1897, to stockholders of record at the close of business Feb. 27. The Transfer books of the preferred stock will be closed from Feb. 28 to Mar. 10, both inclusive. Checks will be mailed.

1133-3 EDWARD C. LEE, Treasurer.

WANTED,

Assistant to Cashier in Gas Office.

Must thoroughly understand double-entry bookkeeping, stenography and typewriting. State age, sex, experience, references and salary expected. Address

1133-2 "X. Y. Z.," care this Journal.

WANTED,

Salesman for First-class Line of Gas and Gasoline Stoves

to represent us in the East. State age, experience, etc. References required. Address

1132-2 "SALESMAN," care this Journal.

ENGAGEMENT DESIRED

As Supt. of Gas (Coal or Water) or Gas and Electric Light Works.

Best of references. Ten years' experience gas; fifteen years' combination. Address

HOWARD A BROOKE,
1133-5 Saratoga Springs, N. Y.

ASSISTANT SUPERINTENDENT.

A young man, a graduate of Stevens Institute, who has been traveling for the Engineering Department of the United Gas Improvement Company five years, wants a stationary position as Assistant to Superintendent or Manager. Address

1133-1 No. 27, care this Journal.

ENGAGEMENT DESIRED,

As Manager or Superintendent of Gas or Gas and Electric Light Works.

Thoroughly competent and reliable. Address

1129-6teow "ENGINEER," care this Journal.

ENGAGEMENT DESIRED

As Manager or Superintendent of Gas Works,

By a thoroughly competent man.

1127-tf Address "W.," care this Journal.

Position Desired

As Superintendent of Gas Works or Gas and Electric Light Works,

By a man 34 years of age. Sixteen years' experience in the manufacture and distribution of Coal Gas as Supt., and four years in the Electric line. Thoroughly competent to take charge of any plant, separately or combined. A practical mechanic, and understands the erection of gas plants and everything pertaining to the business. Not afraid of work. Salary no object until ability is proven. Best of references.

1102-tf Address "M. E. J.," care this Journal.

WANTED,

Position to take full charge of works, or Superintendent of Manufacturing and Distribution. Seven years' experience in pushing the stove business. At present in charge of works sending out 16,000,000 cu. ft. annually. Twenty per cent. increase in business over year 1895, accomplished through sale of stoves and Welsbach lights. Thirty-seven years old; 21 years in all branches of the gas business. Coal gas works preferred. Reason for desiring change, better school system. Gas Companies and well-known Gas Engineers as references. Salary reasonable. Address

1130-4 "M. L. H.," care this Journal.

FOR SALE.

On account of changing location of our works and purchase of larger holder, we have for sale a Single-lift **Gasholder,** 80 x 30 feet, capacity 100,000 cubic feet. Complete and as good as new. Now in brick tank. Built by Stacey Mfg. Co in 1889. Holder has cup on bottom for telescoping, and guide framing is arranged and punched for additional section. Can be taken down and re-erected in brick or steel tank, as may be desired. Will be sold cheap.

THE AKRON GAS COMPANY,
1129-14t Akron, Ohio.

FOR SALE,

One 8-Foot Station Meter, with 12-Inch Connections.

In good order and in use. Address

1127-tf NEW HAVEN (CONN.) GAS LIGHT CO.

For Sale.

A Small Gas and Electric Light Plant,

in a Southern city of 3,800 inhabitants.

Address FORT WAYNE ELECTRIC CORPORATION,
1097-tf Fort Wayne, Ind.

FOR SALE.

Hydraulic, Dip, Branch and Ascension Pipes, Mouthpieces and Lids, for four Benches of 5's and for one Bench of 3 retorts.

Two Coolers, or Air Condensers, each of 150 000 cubic feet capacity.

Multitubular Condenser, shell, 36 in. diameter, with 98 2-in. tubes, 10 ft. 6 in. long.

D-Shaped Tar Extractor, 8 ft. long, 1 ft. 6 in. deep.

Scrubber, 48 in. diameter, 11 ft. 9 in. high. Three manholes, 11 in. by 15 in.

8-inch Center Seal. Four Purifiers, 8 ft. x 6 ft.

KEY CITY GAS CO.,
1119-tf Dubuque, Iowa.

GLOW GAS LIGHT.

Guaranteed First-class Glowing Device.

No Infringement of Patents. Specially Powerful as to Lighting Qualities.

$112.50 per 1,000 lights (pieces). Sample lot of 100 pieces, $12, f.o.b. and C. O. D.

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NO EXTRA LABOR OR OPERATING EXPENSES.

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Mich. Ammonia Works, Detroit, Mich.

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E. H. Nickel Tips for Water Gas a Specialty.

THEO. CLOUGH, - - Dobbs Ferry, N. Y.

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Consolidated of New Jersey,
Detroit,
Madison,
Milwaukee,
Grand Rapids,
New York,
Syracuse,
St. Paul.

GUSTAVUS MAAS,

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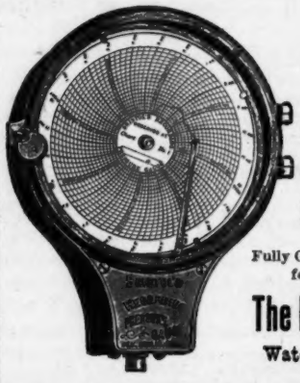

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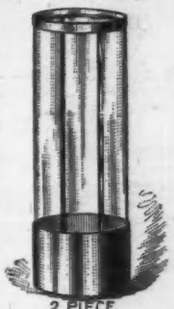

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BLOCKS, TILES, FIREBRICKS, FIRE CEMENT,

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10 & 12 Old Slip, New York.

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Has been made by

WILDER'S VOLUMETRIC GOVERNORS.

They control the pressure at the burner, and deliver the quantity for which they are set regardless of high or low pressure in the supply.

WELSBACH LIGHTS are fully controlled, and the governors soon pay for themselves by preventing the breaking of mantles and chimneys. Thousands are already in use. Orders may be given to the Welsbach Co., or sent to ourselves.

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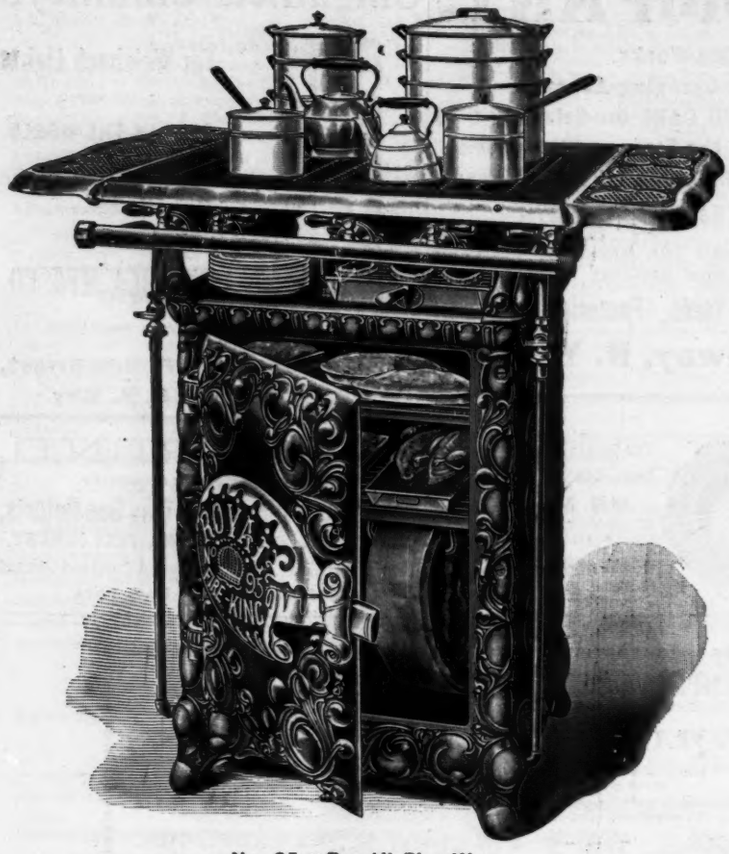

No. 95 "Royal" Fire King.

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No. 95 "Royal" Fire King.

THE GREAT WHITE ENAMELED GAS RANGE.

This is the Range that created such sensation at the Gas Exposition, Madison Square Garden, New York.

Just to think—the Inside Linings are all White Enameled, so they cannot rust and can always be kept sweet and clean. It has a hundred other good points above other Gas Ranges.

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APPARATUS BY WHICH COAL GAS CAN BE BROUGHT UP TO 22 or 24 CANDLE POWER, MAKING A WHITE LIGHT THAT WILL BURN WITHOUT SMOKING.

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GEORGE G. RAMSDELL, General Manager. Correspondence Solicited.

INJUNCTION ISSUED AGAINST INFRINGERS.

On September 23d the United States Circuit Court for the Southern District of New York granted an injunction restraining and enjoining the further infringement of our Welsbach patent. READ IT.

UNITED STATES CIRCUIT COURT,
Southern District of New York.

WELSBACH LIGHT COMPANY,
vs.
A. LIEBES.
} IN EQUITY.

The President of the United States,

TO A. LIEBES, and his servants, agents, attorneys and workmen, GREETING:

WHEREAS, It has been represented to us in our Circuit Court of the United States for the Second Circuit and Southern District of New York, that Letters Patent of the United States No. 438,125, were issued in due form of law on the 7th day of October, 1890, to Carl Auer von Welsbach, assignor of the complainant, then known as "Welsbach Incandescent Gas Light Company of New Jersey," and that the complainant herein is the owner of said Letters Patent, and that you, the said A. Liebes, have infringed the rights secured by the aforesaid Letters Patent, by making, using and selling to others to be used, incandescent devices for gas burners, embodying and containing the invention and improvements described and claimed in said Letters Patent No. 438,125.

NOW, THEREFORE, We do strictly command and enjoin you, the said A. Liebes, and your attorneys, agents, servants and workmen, under the penalties which may fall upon you in case of disobedience, that you forthwith and forever desist from directly or indirectly making, or causing to be made, delivering, vending, or causing to be sold, offering for sale, using, or causing to be used in any manner, any incandescent devices for gas burners, like, or similar to those which you have heretofore made, used or sold, containing or embodying the invention and improvements described in said Letters Patent No. 438,125, and claimed in the claim thereof, and from counterfeiting or imitating the said invention or improvements or any part or parts thereof, and from in any manner or way whatsoever, violating or infringing the said Letters Patent No. 438,125 and the claim thereof, and from doing, or causing to be done, any other act or thing whatsoever in infringement of the said Letters Patent No. 438,125.

WITNESS, The Honorable Melville W. Fuller, Chief Justice of the United States, at the City of New York, in the Southern District of New York, this twenty-fourth day of September, A. D., 1896.

(SEAL) JOHN A. SHIELDS, Clerk.

(Endorsed) U. S. Circuit Court, Southern District of New York, in Equity.—Welsbach Light Company vs. A. Liebes. Injunction.

A Copy of a Writ of Injunction this day issued out of my office. JOHN A. SHIELDS, Clerk.

We shall proceed against all infringers; manufacturers, dealers and users being equally liable to injunction and damages. The decree of the court awarding the injunction also awards profits and damages. Do not be misled or deceived by guarantees offered by infringers, as such guarantees will not protect you against suit, injunction and damages. For your own protection see that you get the genuine Welsbach light. All other incandescent gas lights are infringements.

WELSBACH LIGHT COMPANY.

CHAS. M. JARVIS, Prest. & Chief Engineer. BURR K. FIELD, Vice-President. GEO. H. SAGE, Secretary. FRANK L. WILCOX, Treasurer.

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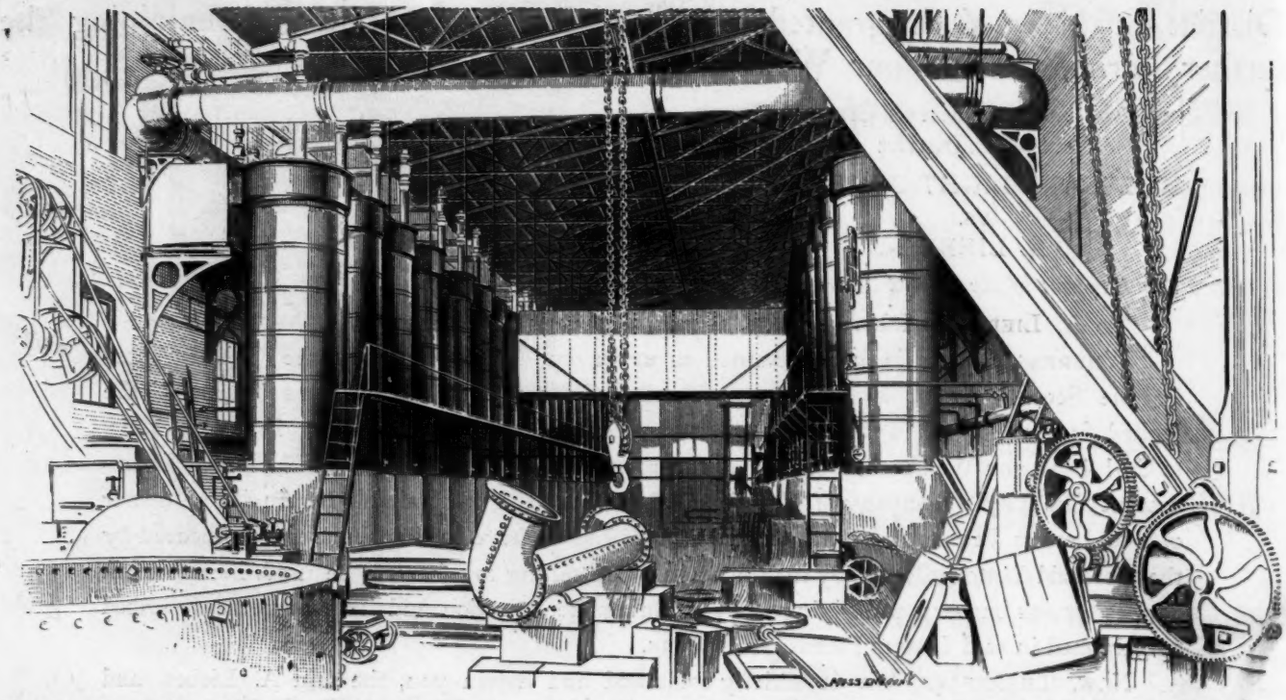

The above illustration is taken direct from a photograph, and shows the interior of a Boiler House, the Roof of which was designed and built by us for the Amoskeag Manufacturing Company, at Manchester, N. H. The building is 75 feet in width by 275 feet in length, the walls being made of brick and the roof being made of iron—iron trusses, iron purlins, and covered with corrugated iron—so that there is absolutely no woodwork anywhere about the building which can take fire. For Boiler Rooms this construction particularly commends itself.

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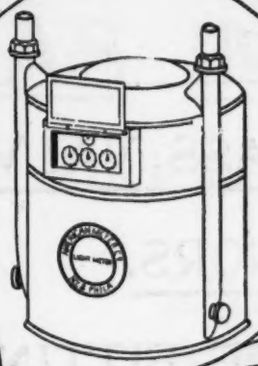
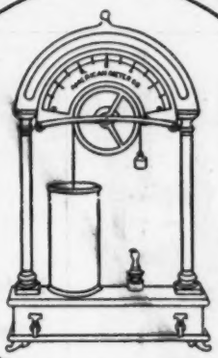
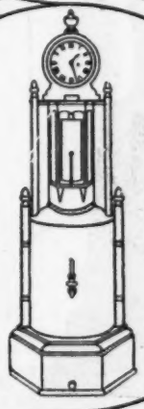






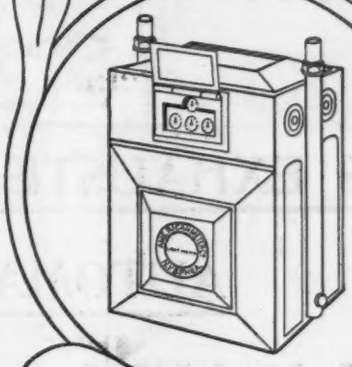
PUBLIC LIGHTING TABLE.

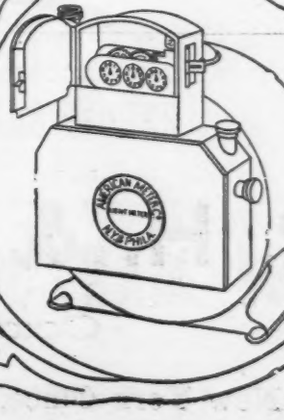
MARCH, 1897.

Day of Week.	Table No. 1. Following the Moon. Date.	Light.	Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Extinguish.
				P.M.	A.M.
Mon.	1	6.20 PM	5.30 AM	5.30	5.45
Tue.	2	6.20 NM	5.30	5.30	5.45
Wed.	3	6.20	5.30	5.30	5.45
Thu.	4	6.20	5.30	5.30	5.45
Fri.	5	6.20	5.30	5.40	5.35
Sat.	6	6.20	5.30	5.40	5.35
Sun.	7	9.30	5.20	5.40	5.35
Mon.	8	10.30	5.20	5.40	5.35
Tue.	9	11.30	5.20	5.40	5.35
Wed.	10	12.30 AM	5.20	5.40	5.35
Thu.	11	1.20 FQ	5.20	5.40	5.35
Fri.	12	2.00	5.20	5.50	5.20
Sat.	13	2.40	5.20	5.50	5.20
Sun.	14	3.20	5.10	5.50	5.20
Mon.	15	3.50	5.10	5.50	5.20
Tue.	16	4.20	5.10	5.50	5.20
Wed.	17	No L.	No L.	5.50	5.20
Thu.	18	No L. FM	No L.	5.50	5.20
Fri.	19	No L.	No L.	6.00	5.10
Sat.	20	6.40 PM	9.50 PM	6 00	5.10
Sun.	21	6.50	11.10	6.00	5.10
Mon.	22	6.50	12.30 AM	6.00	5.10
Tue.	23	6.50	1.40	6.00	5.10
Wed.	24	6.50 LQ	2.40	6.00	5.10
Thu.	25	6.50	3.30	6.00	5.10
Fri.	26	6.50	4.10	6.10	4.55
Sat.	27	6.50	4.40	6.10	4.55
Sun.	28	6.50	4.50	6.10	4.55
Mon.	29	6.50	4.50	6.10	4.55
Tue.	30	6.50	4.50	6.10	4.55
Wed.	31	6.50	4.50	6.10	4 55

TOTAL HOURS LIGHTING DURING 1897.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	233.00	January	423.20
February	187.20	February	355.25
March	202.00	March	355.35
April	170.40	April	298.50
May	163.00	May	264.50
June	140.40	June	234.25
July	151.40	July	243.45
August	167.30	August	280.25
September	174.40	September	321.15
October	200.00	October	374.30
November	205.20	November	401.40
December	220.10	December	433.45
Total, yr.	2216.00	Total, yr.	3987.45





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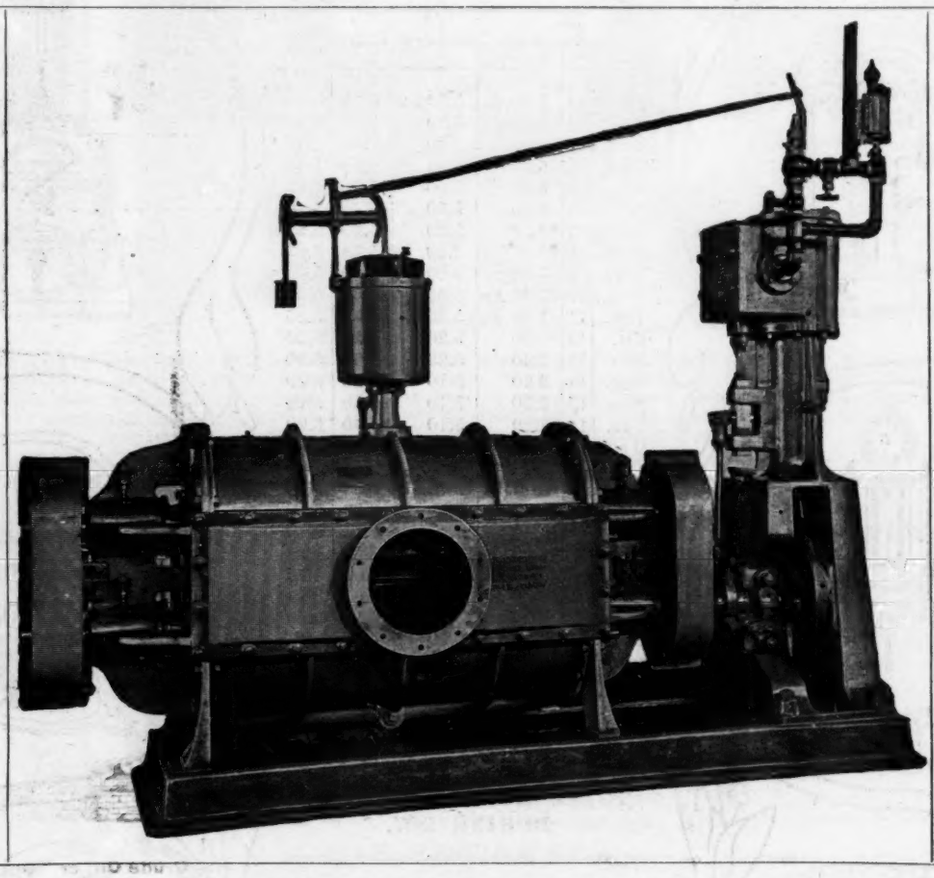
AUTOMATIC GAS GOVERNORS.

GAS VALVES. PIPE FITTINGS.

New Design of Direct Connected Engine and Exhauster on Same Bedplate.



This Design is Used for all Exhausters from No. 7 to No. 10, Inclusive.

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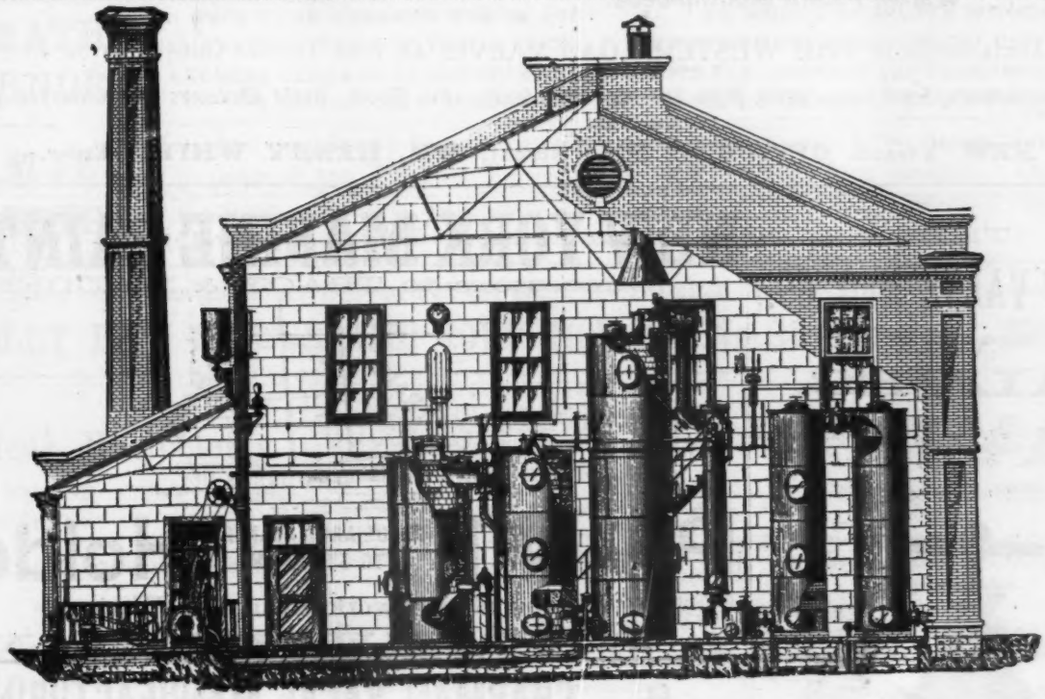

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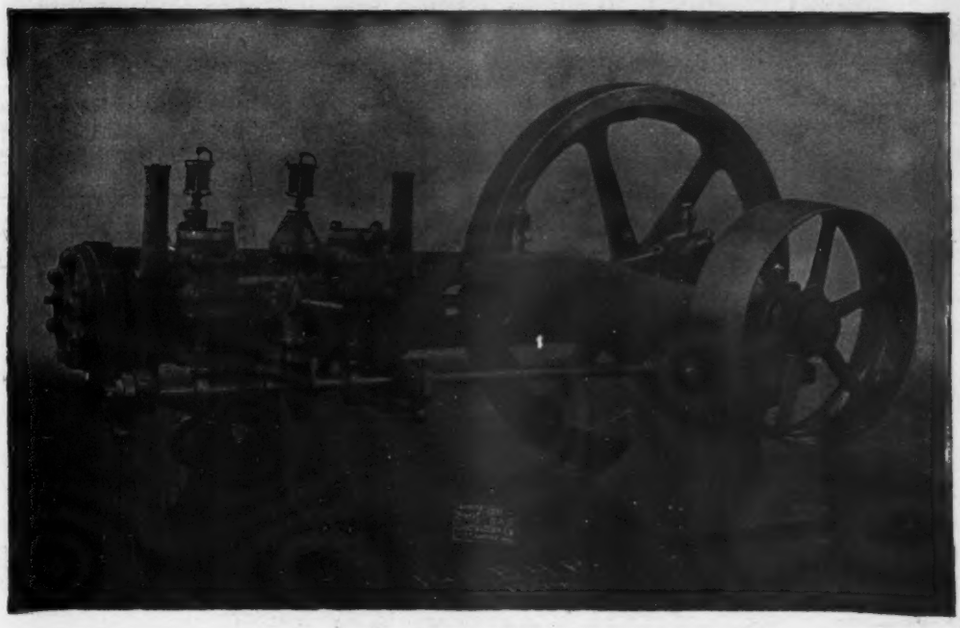

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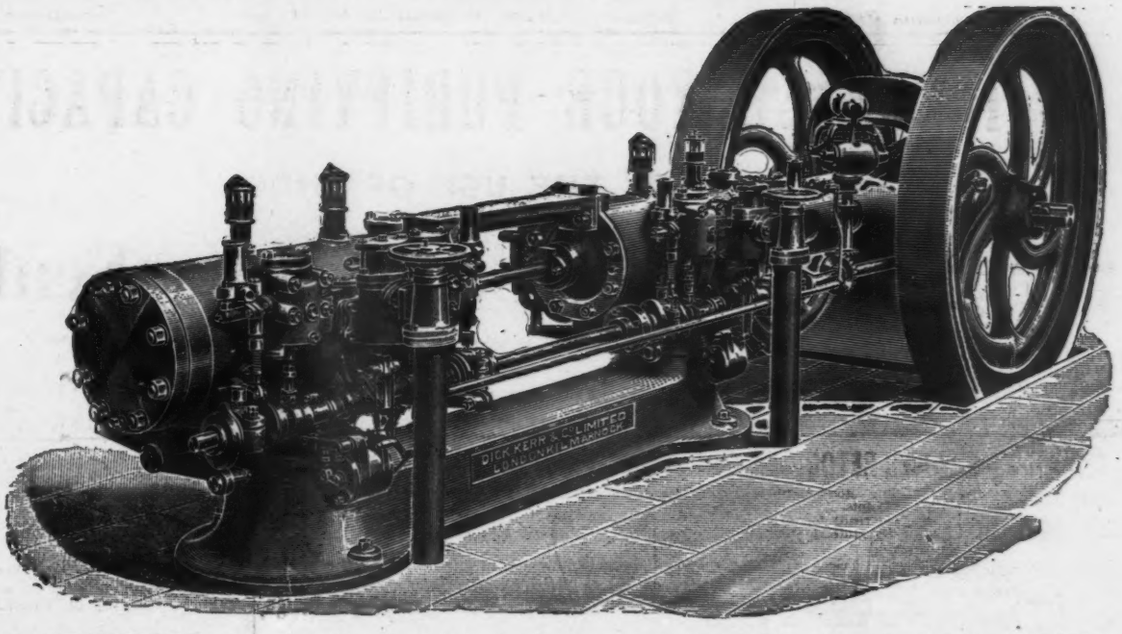

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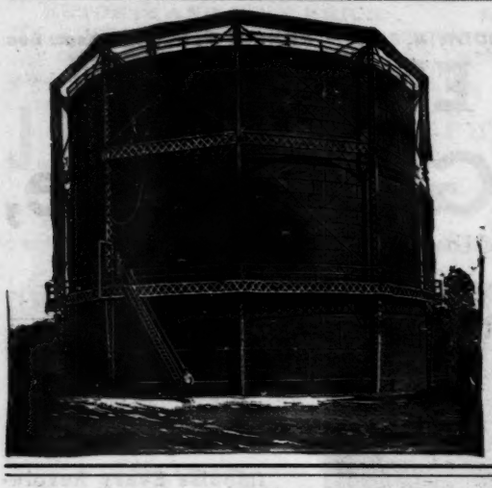

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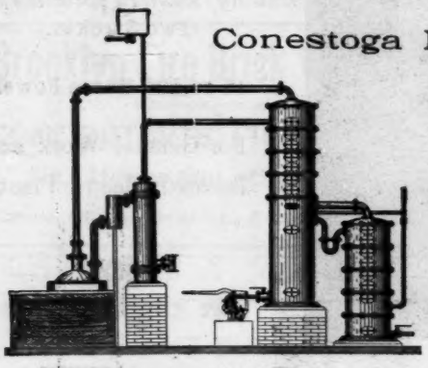

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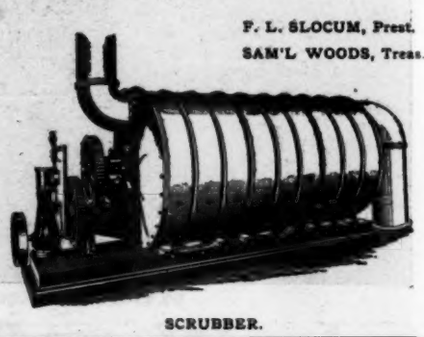

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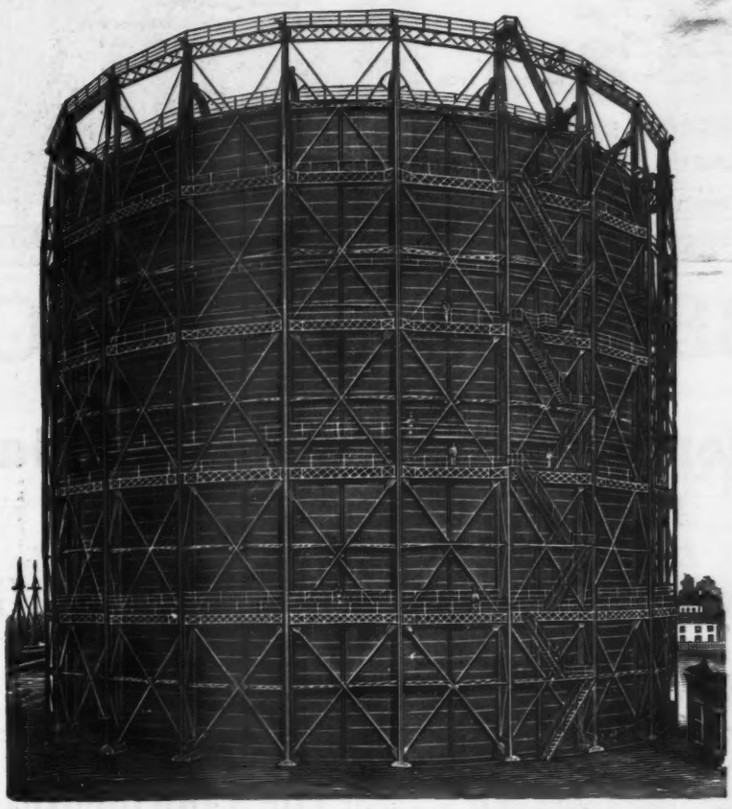

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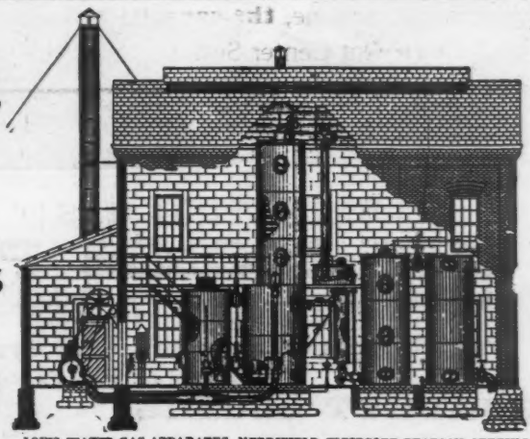

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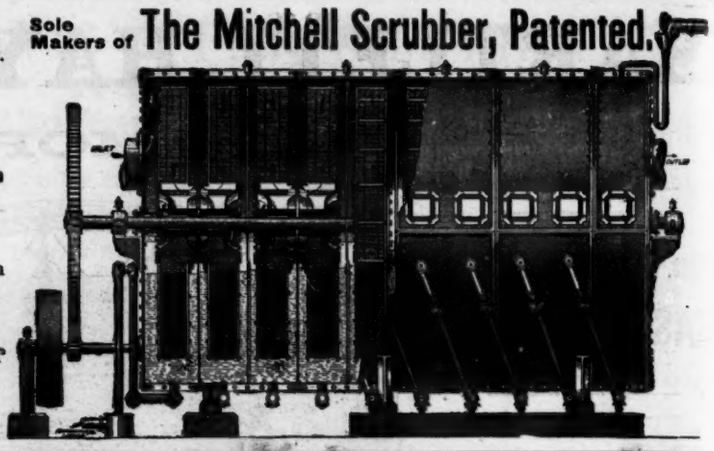

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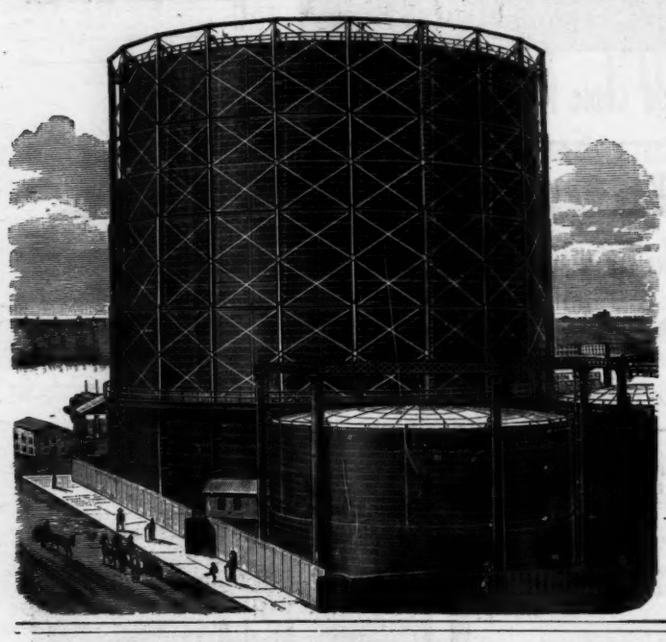

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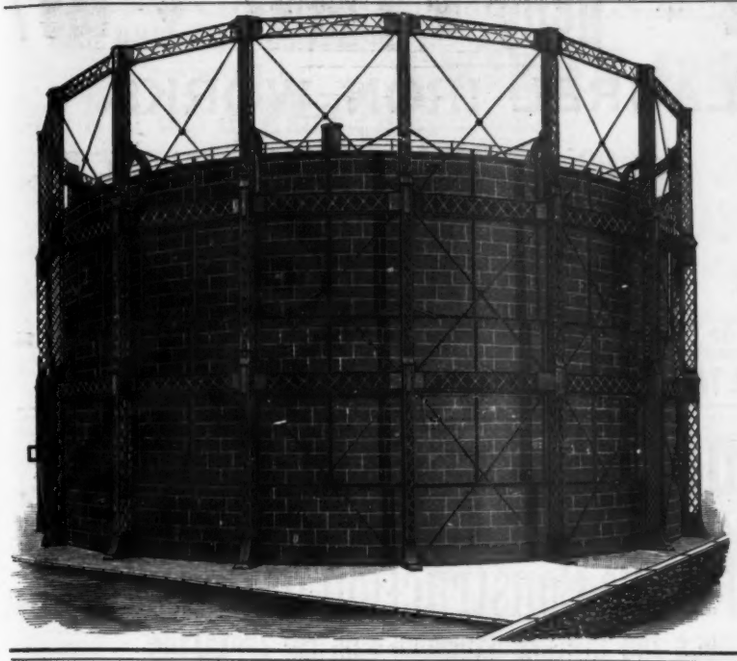

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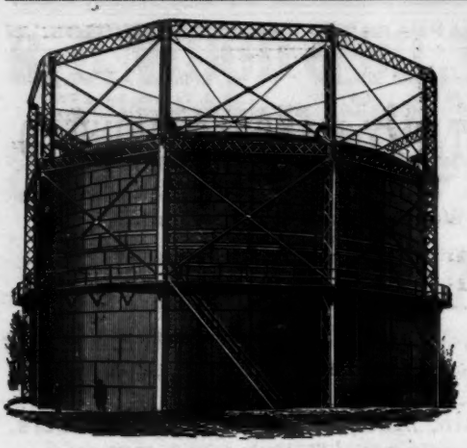

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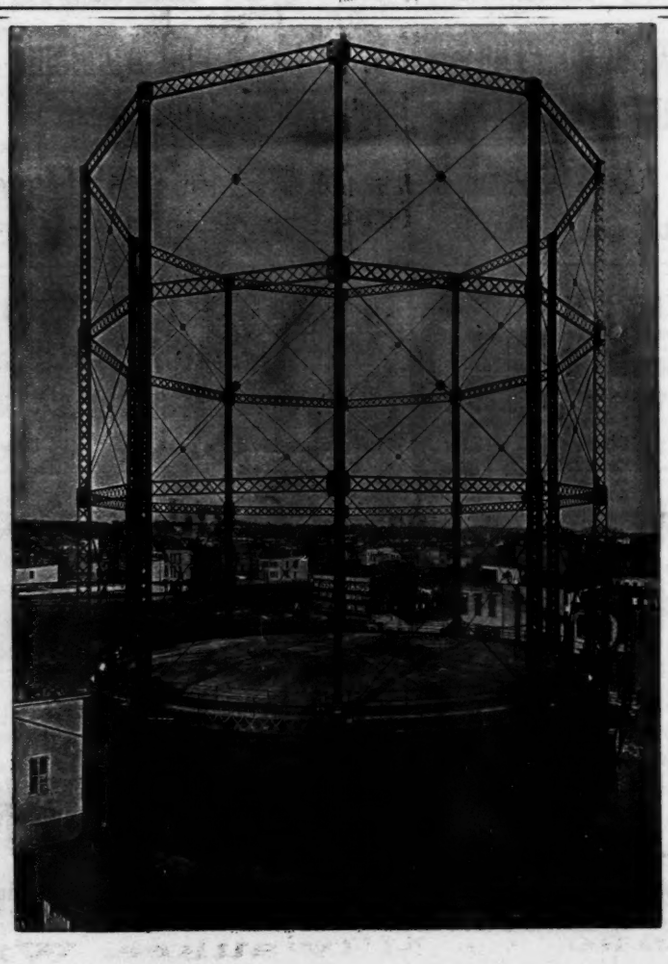

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